

The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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Casting an Anvil Bed.

The proper design, construction and erection of an anvil-bed is a subject deserving the most careful attention of the ironworker, and depends to a great extent both upon the character of the material to be operated upon and the size and weight of the ram to whose blows it is subjected. It is a popular error to suppose that the principal office of the bed is to gradually diminish the force of the blow, but since it is an unyielding mass, the molecules of which are in intimate connection

the bed in one piece. The latter method is much to be preferred to the former, for various and obvious reasons, and in adopting it the bed is cast directly above the foundation in an inverted position. After having cooled the casting and removed the mold, the former is turned into its natural position on trunnions supported by suitable timber framing, and though this operation may appear somewhat difficult to perform, it can be safely and speedily effected. In constructing the bed, three separate subjects are to be considered: 1, the mold; 2, the

cast iron, we have for its weight the following:

$$W = 6H + 8G.$$

If steel is to be employed as the material for construction, we have

$$W = 6H + 12G.$$

These formulae are, however, applicable only in the case of drop hammers, while for such in which steam is admitted above the piston they should be

$$W = 6H + 10 \text{ to } 12 G \text{ (for iron bed),}$$

$$W = 6H + 13 \text{ to } 15 G \text{ (for steel bed).}$$

The mold should be placed directly over the

in direct communication with the gates through which the molten metal enters, are provided for the trunnions. The mold is dried by maintaining a light fire in its interior. It may happen that the iron which enters through the gate becomes chilled and closes the channel, and in this case the metal may be introduced through the open top of the mold. The latter should be firmly secured to prevent any change of position, and the corners are furnished with angle irons which guard against distortion. The necessary supply of iron is drawn from a

be commenced at the top. If the lower portion of the mold is removed first, the stability of the whole structure is seriously impaired, and a certain inclination to either side will inevitably take place. This would present considerable difficulties to all further operations, and may, in fact, result in a complete failure of the whole work. After the greater part of the mold has been removed, so as to expose the trunnions, a substantial timber framing, shown in Fig. 5, is erected, being intended as a support for the casting. The timber employed should

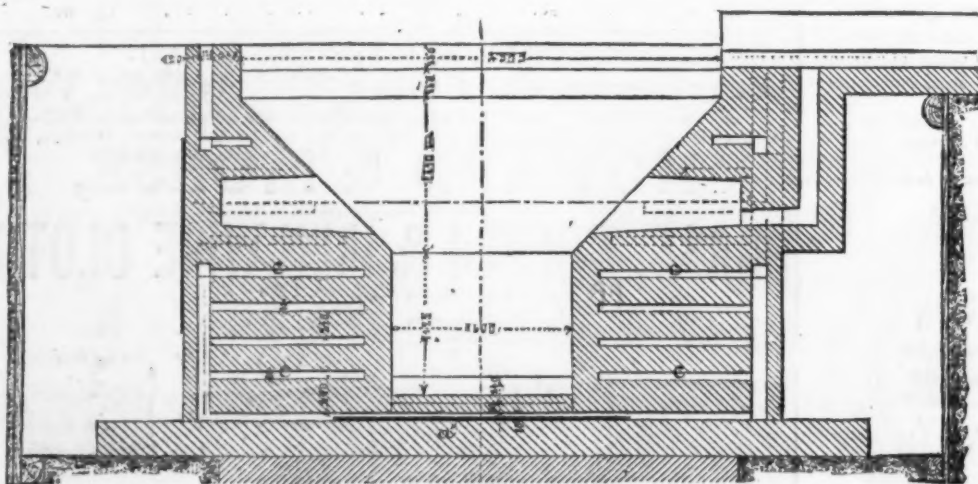


Fig. 1.—Longitudinal Section of the Mold.

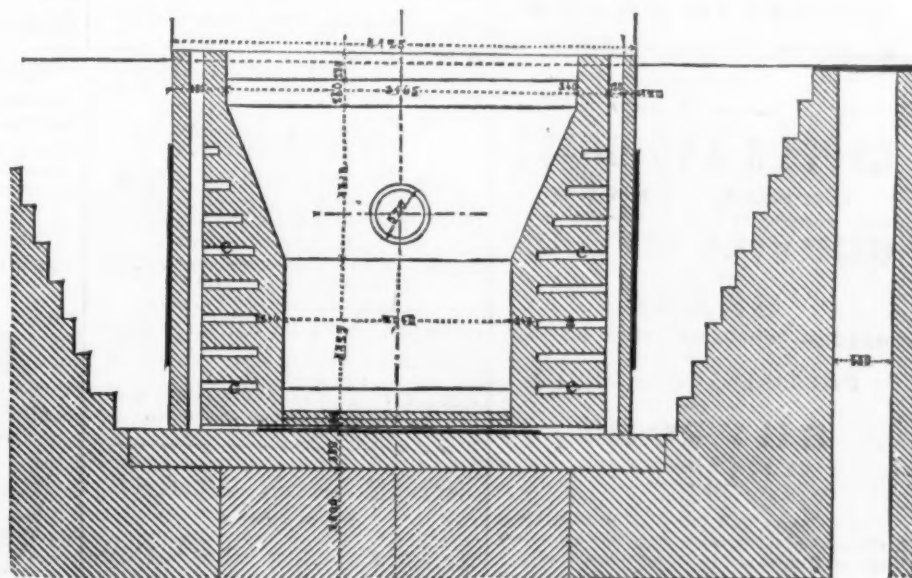


Fig. 2.—Cross Section of the Mold.

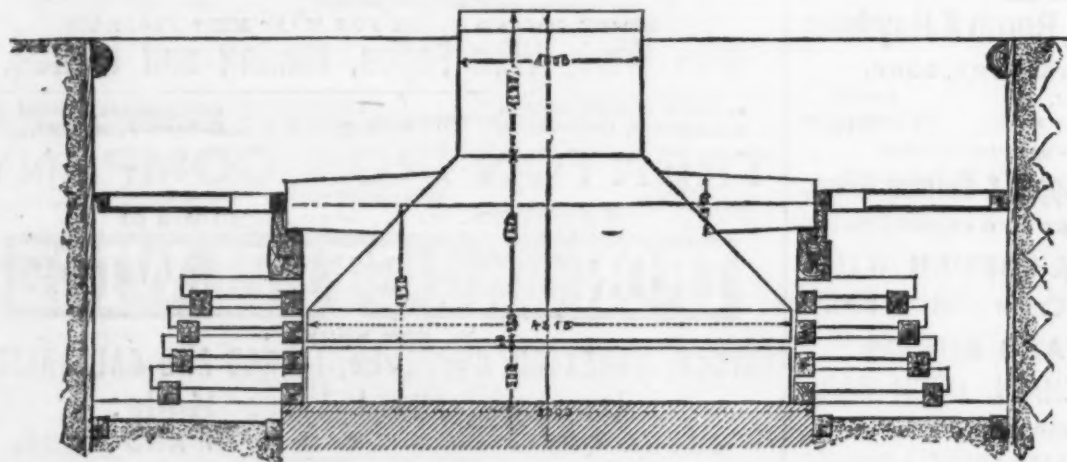


Fig. 3.—Longitudinal Section Showing Anvil Bed in Proper Position.

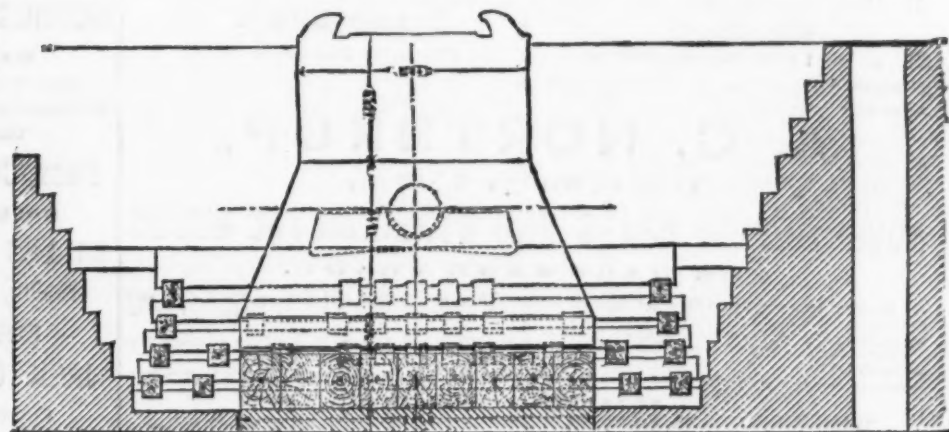


Fig. 4.—Cross Section Showing the Bearings of the Trunnions and the Frame.

tion, it will be readily seen that this is not the case. It has been observed that both excessive and insufficient weights of anvil beds produce evil results. If the bed is not heavy enough the foundation suffers considerably and is rapidly destroyed, unless proper remedies are resorted to before appreciable damage has been done. If, on the other hand, the bed is too heavy, the blow of the ram causes the latter to rebound, and may result in a broken cylinder head or piston, or a general destructive influence on the different moving parts. An example was recorded in a German establishment where the piston of a hammer of average weight completely fractured the upper cylinder cover, resulting in serious damage. It has often been said that the foundation should possess a certain degree of elasticity, but there seems to be no reason to warrant this assertion, since an elastic foundation would very probably require an unnecessarily large amount of work to be performed on a mass of metal in order to produce a desired result. There is, however, a considerable diversity of opinion in regard to this point, and under the existing circumstances it is perhaps difficult to advance any perfectly correct statement. Within late years elasticity in this direction has been deemed unnecessary, and perfectly rigid foundations are, as a rule, adopted. The anvil-bed, which is generally made of cast iron, steel being employed in some cases, may be cast in several parts, which are afterward firmly bolted together; if, however, the bed is not excessively heavy, and if all required facilities for transportation are available, the bed may be cast in one piece, thus avoiding the difficulties resulting from imperfect joints. These joints, if indispensable, should be very accurately made in order to insure a perfectly uniform distribution of the effects of the blows. The masonry now most generally employed in constructing the foundations consists of brick laid in cement, and the cross section gradually diminishes toward the top. Great care should be exercised in insuring thoroughness in this part of the work, as the stability of the entire structure depends upon its proper execution. As previously stated, the construction of the anvil-bed may be effected in two ways—namely, by riveting the several parts after having been cast, and by casting

casting operation; 3, the proper mounting of the bed. In order to illustrate the method of proceeding, we will here take as an example the case of an anvil-bed weighing about 150 tons, the weight of the ram being somewhat over 12 tons. It may be well, in this connection, to give a few simple formulae for the calculation of the approximate weights of the beds for hammers of different dimensions. If we designate the weight of the bed by W , the weight of the hammer by G , and the length of stroke by H , then, if the anvil-bed is to be made of

foundation and the latter provided with a fire-proof covering, above which air spaces are arranged so as to facilitate the escape of the gases. The bed is cast in an inverted position in order to obtain a homogeneous mass of metal, all impurities and air bubbles rising to the surface where they may be readily removed. In the case here considered, the lowest air space contains a cast-iron plate, a , about 1½ inches thick (shown in Figs. 1, 2 and 7), which supports the cores for the upper part of the bed. The mold is constructed of fire-brick, and suitable spaces,

cupola, temporarily erected near the mold, although if the necessary means of transportation are at hand, ladles may be filled in the foundry and carried to the point where required. It will thus be seen that the operation of casting presents no special difficulties. (For Figs. 6 and 7 see p. 9.) The last and undoubtedly most difficult part of the work is the turning and proper erection of the bed. After allowing a reasonable length of time for the cooling of the casting the mold is removed, and it should here be stated that this work should

be sound, without cracks or other defects, since it is subjected to considerable strain in the subsequent operation. The trunnions revolve in bearings shown in Fig. 6 (p. 9), the lubricant employed being soap, and in order to insure perfect rigidity and strength it is essential that the greatest possible care be taken to properly secure the several parts. The remaining portion of the mold is then gradually and carefully removed, and all precautions adopted to effect a successful turning of the bed, which is greatly facilitated by so arranging the supports that the center of gravity is slightly above the bearings. Before finally placing the anvil-bed in its permanent position, the foundation is provided with a layer of wood and the bed is slowly lowered by gradually removing the supports. The timber framing is preserved, and may be successfully employed in carrying out other work of a similar nature. Our accompanying engravings are admirably adapted to give a clear idea of the arrangement of the mold, casting and supports, and will undoubtedly be found as acceptable as any further explanatory remarks.

Improved Railway Spring Making Machine.—An improved machine for manufacturing railway springs has recently been constructed for the Lancashire & Yorkshire Railway Company, England. The machine combines all the processes of shearing, tapering, shaping, punching, slotting, &c.; it is stated to be very durable and compact, and occupies a space of not more than 9 feet 6 inches. It consists of an upright frame, carrying three slides which operate a couple of disks for pointing the spring ends and putting in the nibs, and a punch for cutting the horizontal slot. A fourth slide works a circular punch for the center bolt hole, and above this a pair of shears for cutting the steel bars to the requisite length are carried at one end of the machine, the other end being provided with a pair of rolls. The bottom roll is grooved to prevent the spreading of the metal when subjected to pressure, and is eccentric for tapering the ends of the springs. The machine is driven by ordinary gearing and is operated by one man.

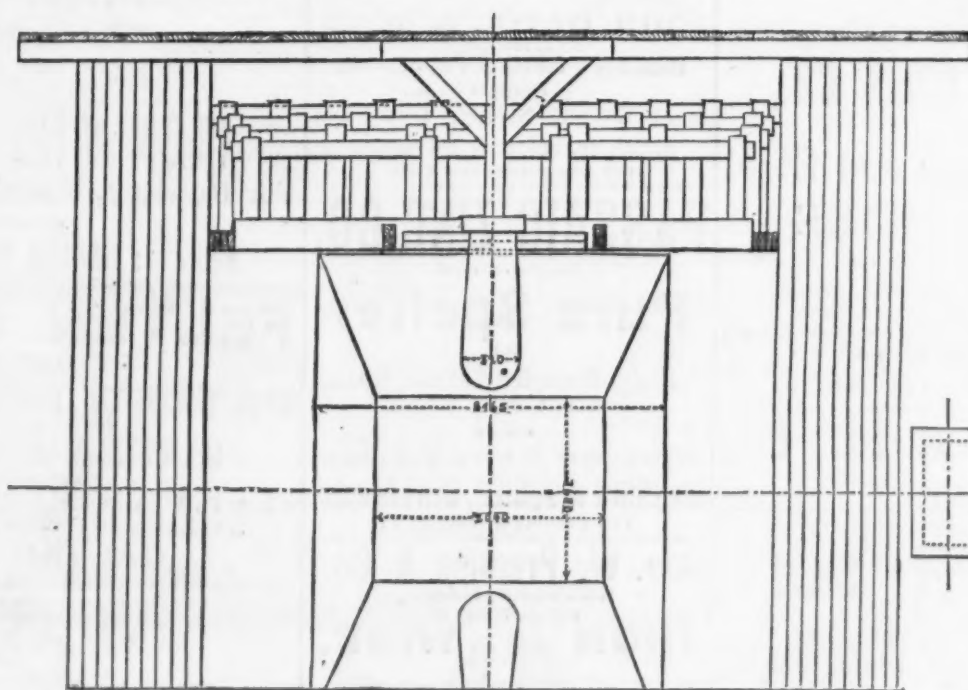


Fig. 5.—Plan of Timber Frame.

CASTING AND ERECTION OF AN ANVIL BED.

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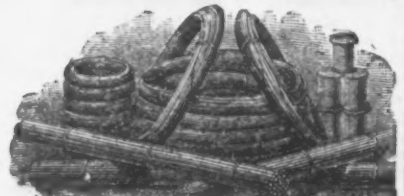


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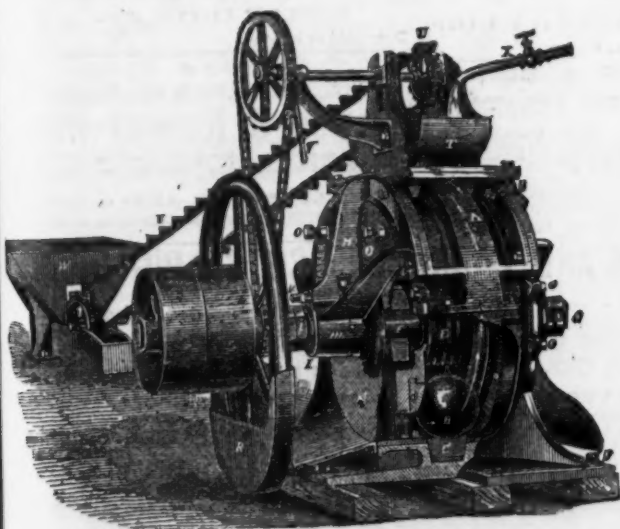


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IRON STATISTICS FOR 1891.

We condense the following from the forthcoming annual report of Mr. James M. Swank, secretary of the American Iron and Steel Association:

The production of the leading articles of iron and steel in the United States in 1891 is given in net tons in the following table in comparison with the production of the same articles in 1890. With the exception of iron rails our production of every article enumerated was larger in 1891 than in 1890 or in any other year of our history:

Products.	1890.	1891.
Pig iron.....	4,995,414	4,641,564
All rolled iron, including nails and excluding rails.....	1,838,906	2,155,346
Bessemer steel rails.....	554,460	1,330,308
Open-hearth steel rails.....	13,615	25,217
Iron and all other rails.....	493,762	485,581
Kegs of cut nails and spikes, included in all rolled iron.....	5,370,572	5,794,206
Crucible steel ingots.....	78,424	89,769
Open-hearth steel ingots.....	112,953	146,946
Bessemer steel ingots.....	1,203,173	1,539,157
Blooms from ore and pig iron.....	74,589	84,666

OUR IMPORTS OF IRON AND STEEL FROM 1871 TO 1891.

The foreign value of the imports into the United States from all countries of iron and steel and manufactures thereof, including tin plates, has been as follows in the eleven years from 1871 to 1891:

Years.	Values.	Years.	Values.
1871.....	\$57,866,899	1877.....	\$10,874,390
1872.....	75,077,617	1878.....	18,012,016
1873.....	60,005,928	1879.....	33,331,560
1874.....	37,659,192	1880.....	80,443,368
1875.....	27,351,101	1881.....	61,555,078
1876.....	30,010,603		

The foregoing table of values includes all our imports of iron and steel and manufactures thereof, of every description whatever. In the following table we give the quantities of all the leading iron and steel products imported into the United States from all countries in the 11 years from 1871 to 1891, except steel in ingots, bars, sheets and wire for which statistics of values only are obtainable. To be more specific, the figures below embrace only our imports of pig, bar, boiler, band, hoop, scroll and sheet iron, iron and steel rails, castings, old and scrap iron, anchors, cables and chains and tin plates.

Years.	Net tons.	Years.	Net tons.
1871.....	1,278,965	1877.....	2,567,777
1872.....	1,335,074	1878.....	2,846,434
1873.....	717,701	1879.....	858,348
1874.....	337,845	1880.....	2,119,341
1875.....	258,477	1881.....	1,121,707
1876.....	228,710		

The importations in 1890 were the largest in our history. The decline in 1891 was about \$10,000,000 in the value of all iron and steel imports, and about 800,000 net tons in the quantities of the leading articles just enumerated. The following table gives, in net tons, the details of our imports in the last six years of the leading articles above:

Years.	Net tons.	Years.	Net tons.
1871.....	1,278,965	1877.....	2,567,777
1872.....	1,335,074	1878.....	2,846,434
1873.....	717,701	1879.....	858,348
1874.....	337,845	1880.....	2,119,341
1875.....	258,477	1881.....	1,121,707
1876.....	228,710		

The rapid and unprecedented increase in our iron and steel imports in 1879 and 1880 has been sufficiently explained in preceding annual reports. The same causes which produced this increase may be credited with our large importations of iron and steel rails in 1881. The country could not supply its own pressing need of these articles. The large quantities of pig iron imported in 1881 were not, however, due to a scarcity of domestic pig iron, but to the cheapness, notwithstanding the duty, of the foreign article. There was a noticeable decline in 1891 of importations of old and scrap iron.

OUR IMPORTS OF IRON AND STEEL IN THE FIRST QUARTER OF 1892.

Products.	Net tons.	Values.
Commodities Imported.....	99,333	\$1,547,501
Pig iron.....	300	19,169
Castings.....	21,338	860,527
Bar iron.....	189	6,779
Boiler iron.....	21,150	558,453
Band, hoop and scroll iron.....	51,002	1,538,772
Railroad bars or rails, iron.....	1,949	47,831
Railroad bars or rails, steel.....	65,614	2,004,661
Sheet iron.....	481	45,864
Old and scrap iron.....	57,268	4,410,446
Anchor, cables and chains.....		
Tin plates.....		

Total..... 314,636 \$10,016,770

The figures given in this table show a larger aggregate importation of the articles mentioned than occurred in the corresponding period of 1891, and at first sight indicate no diminution in the volume of imports this year as compared with last year. But the demand for iron and steel has slackened and prices have fallen in this country since the orders were sent abroad for the articles which were imported in the first quarter of this year, and further importations during the year must show a decline.

OUR IMPORTS OF IRON ORE IN 1879, 1880 AND 1891.

During the years 1879, 1880 and 1891 our imports of iron ore were derived from the

following countries, as we are officially advised by the Chief of the Bureau of Statistics: Brazil, Denmark, France, French West Indies, French Possessions in Africa and adjacent islands, Germany, England, Scotland, Ireland, Gibraltar, Nova Scotia, New Brunswick and Prince Edward Island, Quebec, Ontario, Manitoba and the Northwest Territory, British Columbia, British Possessions in Africa and adjacent islands, other British Possessions, Italy, Portugal, Russia on the Baltic and White Seas, Spain, Spanish Possessions in Africa and adjacent islands, Turkey in Asia, Turkey in Africa, United States of Colombia, Uruguay and Venezuela.

The following statement shows the quantity and value of iron ore imported into the United States during the calendar years 1879, 1880 and 1891, by customs districts. Most of the ore was imported from Spanish and Mediterranean ports. Previous to 1879 the quantity of iron ore annually imported was not preserved by the Treasury Department, but in no year did it amount to 100,000 tons:

Customs District.	1879.	1880.	1891.
Baltimore.....	27,000	27,000	27,000
Boston.....	2,438	2,438	2,438
Brooklyn.....	1,128	1,128	1,128
Channahon.....	509	509	509
Cincinnati.....	1,187	1,187	1,187
Detroit.....	4,101	4,101	4,101
Galveston.....	2,155	2,155	2,155
Hammond, N. J.....	1,000	1,000	1,000
Harbors, N. J.....	1,000	1,000	1,000
Indianapolis.....	1,000	1,000	1,000
Long Beach.....	1,000	1,000	1,000
Los Angeles.....	1,000	1,000	1,000
Manila.....	1,000	1,000	1,000
Memphis.....	1,000	1,000	1,000
Mobile.....	1,000	1,000	1,000
New York.....	1,000	1,000	1,000
Philadelphia.....	1,000	1,000	1,000
Puerto Rico.....	1,000	1,000	1,000
San Francisco.....	1,000	1,000	1,000
San Pedro de Macoris.....	1,000	1,000	1,000
St. Louis.....	1,000	1,000	1,000
St. Paul.....	1,000	1,000	1,000
St. Petersburg.....	1,000	1,000	1,000
St. Thomas.....	1,000	1,000	1,000
St. Vincent.....	1,000	1,000	1,000
Texas.....	1,000	1,000	1,000
Tientsin.....	1,000	1,000	1,000
Yokohama.....	1,000	1,000	1,000

OUR DOMESTIC EXPORTS OF IRON AND STEEL FROM 1871 TO 1891.

The value of the exports from the United States to all countries of domestic iron and steel manufactures thereof in the 11 years from 1871 to 1891 was as follows:

Years.	Values.	Years.	Values.
1871.....	\$11,816,137	1877.....	\$16,630,675
1872.....	10,030,135	1878.....	13,660,369
1873.....	10,189,916	1879.....	12,470,448
1874.....	15,189,807	1880.....	12,650,995
1875.....	10,024,906	1881.....	15,782,282
1876.....	11,705,459		

Our exports of iron and steel and manufactures thereof are made principally to countries on the American Continent, particularly to Canada. Among other countries Australia is a liberal customer for our manufactured articles, England coming next. In 1881 we exported 104 locomotives to foreign countries, a larger number than in any preceding year. The indications are that in this year we will export as many as in last year.

THE PRODUCTION OF PIG IRON IN 1891.

The total production of pig iron in the United States in 1891 was 4,641,564 net tons, or 4,144,254 gross tons. (A net ton is 2000 pounds and a gross ton 2240 pounds.) The production was less than had been generally anticipated. It was a little more than 8 per cent. greater than that of 1890, which was 4,295,414 net tons, or 3,835,191 gross tons. The production of 1890 was 40 per cent. greater than that of 1879, which was 3,070,875 net tons, or 2,741,953 gross tons.

The production of pig iron in 1891 in the pig-iron-producing States was as follows, in the order of their prominence:

States.	Net tons.	States.	Net tons.
Pennsylvania.....	2,195,786	Connecticut.....	25,413
Ohio.....	710,516	Massachusetts.....	18,318
New York.....	559,513	Minnesota.....	7,442
Illinois.....	251,781	Indiana.....	2,303
Michigan.....	187,043	Colorado.....	6,306
New Jersey.....	171,672	Oregon.....	6,156
Missouri.....	109,799	California.....	4,414
Wisconsin.....	102,089	Maine.....	4,400
Alabama.....	98,081	Texas.....	3,000
Tennessee.....	87,406	Vermont.....	2,706
Virginia.....	83,711	Washington.....	1,200
West Virginia.....	66,469	North Carolina.....	800
Maryland.....	48,750		
Kentucky.....	45,972		
Georgia.....	37,494		
Total.....	4,641,564		

The most remarkable fact presented in this table is the prominent place held by Illinois in the production of pig iron. In 1879 her production was 78,143 net tons, and her place in the list of pig iron producing States was eighth; in 1880 her production was 150,556 tons, and she advanced to the sixth place; in 1891 her production was 251,781 tons, and she was fourth in rank. The percentage of production by the four leading States in 1891 was as follows: Pennsylvania, 47 1-5ths; Ohio, 15 1/4; New York, 12 1/4; Illinois, 5 2-5ths. No other State made 5 per cent. of the production of the year. Neither Pennsylvania nor Ohio made the same percentage in 1891 that it made in 1880, nor did Pennsylvania make the same percentage in 1880 that it made in 1879. The percentage for these States in the three years mentioned was as follows: Pennsylvania, 1879, 52 1/4; 1880, 48 1/4; 1891, 47 1-5ths. Ohio, 1879, 14 3-5ths; 1880, 15 5-7ths; 1891, 15 1/4.

The increase in the production of pig iron in this country from 1879 to 1891 (covering the production of the two years 1880 and 1881) was 51 per cent. The New England States and New York and New Jersey increased 63 per cent.; Pennsylvania, 36 per cent.; the Southern States, beginning with Maryland and including West Virginia, 64 per cent.; the Western States, beginning with Ohio and including Missouri and Colorado, 70 per cent.; the Pacific coast, 360 per cent. The percentage of the total production of 1891 in each of these territorial divisions was as follows in round numbers: Northeast, 13; Pennsylvania, 47; the South, 10; the West, 30; the Pacific coast, less than 1 per cent.

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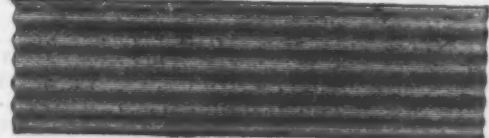
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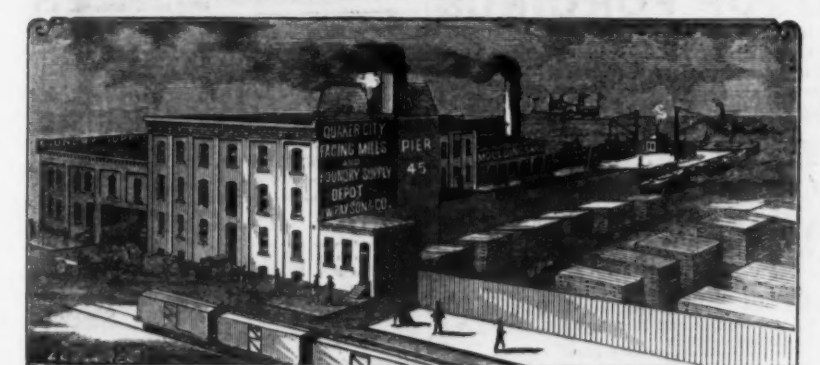
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SILVER GREY IRON A SPECIALTY.

J. W. HOFFMAN & CO.,
Iron Merchants & Railway Equipments.
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manufacturers of Muck Bar and all grades of Plate
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Bar iron, Rails and all shapes in iron. Quotations
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Selling Agents and Commission Merchants
For the sale of
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Charcoal Bloom and Pig a specialty.

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SCRAP OF ALL KINDS A SPECIALTY.
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Universal and Sheared Plates for Bridge and Other Work.
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**Iron Clad Steel Chain and the Celebrated
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Toggles, Eye Bolts and Log Dogs.

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**NEW AND OLD RAILS,
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Spiegeleisen Iron Ores**
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STANDARD
STEEL
WORKS.**

LOCOMOTIVE AND CAR WHEEL TIRES.
Manufactured from the celebrated OTIS STEEL
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Quality and efficiency fully guaranteed. Prices as
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Manufacturers of the Keystone Patent Solid
Steel Calk Horse and Mule Shoes.
These Shoes are made of superior iron and steel,
completely finished and ready for cold shoeing;
have clip and solid steel calk. The holes are
punched through at the proper angles and free
from burrs. Same number of Shoes per keg as in
kegs of unfinished shoes.

The production of spiegeleisen increased
slightly in 1881 over previous years, the
quantity produced in 1881 being 21,086 net
tons. This country makes remarkably slow
progress in the production of this essential
raw material in the manufacture of Bessemer
steel. Both foreign and domestic ores are
used in its production in our furnaces. The
following table shows the production of this
kind of pig iron since 1875:

Years.	Net tons.	Years.	Net tons.
1875	7,839	1879	13,935
1876	6,616	1880	19,003
1877	8,845	1881	21,086
1878	10,074		

Three States made spiegeleisen in 1881—
New Jersey, Pennsylvania and Ohio. Penn-
sylvania's share of the total production
was 16,276 net tons. The spiegeleisen pro-
duced in Ohio was made by the Brier Hill
Iron and Coal Company, of Youngstown, in
a furnace specially built for that purpose
and first blown in in 1881. The Lehigh Zinc
and Iron Company, of Bethlehem, Pa.,
erected a small furnace in 1881 to make
spiegeleisen, but it was not in operation.
The product of 1881 was made by the New
Jersey Zinc and Iron Company, the Cambria
Iron Company, Carnegie Bros. & Co., Limited,
and the Brier Hill Iron and Coal Com-
pany.

The following table shows, in net tons, the
quantity of pig iron produced in each of the
years 1879, 1880 and 1881, with bituminous
coal, anthracite coal and charcoal, it being
understood that the second of these classifica-
tions is not absolutely accurate, as coke is
used as a mixture in many anthracite fur-
naces:

Fuel used.	1879.	1880.	1881.
Bituminous	1,438,978	1,950,205	2,068,264
Anthracite	1,773,024	1,807,531	1,734,472
Charcoal	358,873	537,558	638,358

Total..... 3,570,875 4,295,294 4,441,094
The stocks of pig iron unsold in the hands
of makers or their agents on the 31st of De-
cember, 1881, amounted to 210,896 net tons,
against 456,658 tons at the close of 1880.
The following table, in net tons, shows the
quantity of each kind of pig iron held in
stock by the furnace owners or their agents
at the close of these years.

Kind of fuel.	Dec. 31, 1880.	Dec. 31, 1881.
Bituminous	184,626	36,495
Anthracite	175,862	90,332
Charcoal	96,170	84,050

Total..... 456,658 210,896
The consumption of pig iron in the United
States in 1881 can be approximately ascer-
tained. We produced 4,144,254 gross tons
and imported 464,430 tons. We had in stock
at the beginning of the year 407,730 tons of
domestic pig iron and 164,404 tons of foreign
pig iron. The total supply was 5,180,818
gross tons. At the close of the year we had
on hand 188,300 gross tons of domestic pig
iron and 9953 tons of foreign pig iron, which,
being deducted from the total supply, gives
4,982,565 gross tons as the probable con-
sumption of the year. In our annual report
for the year 1880, published in July, 1881,
we estimated the consumption of 1880 at
3,990,415 gross tons—the elements of our
calculation being the same for that year that
we have taken above for 1881. An increase
of 1,000,000 gross tons in one year in our
consumption of pig iron is a most remark-
able fact. About one-third of this vast in-
crease was used in the production of Besse-
mer steel; the remainder was required to
supply the miscellaneous iron and steel works
of the country. The following table gives the
number of completed furnaces in the United
States at the close of each of the ten years
from 1872 to 1881:

1872.	1873.	1874.	1875.	1877.
612	637	693	713	712
1877.	1878.	1879.	1880.	1881.
716	692	697	701	716

Of 701 furnaces in the United States on
December 31, 1880, there were 446 in blast
and 255 out of blast; of 716 furnaces on
December 31, 1881, there were 455 in blast
and 261 out of blast.

**PRODUCTION OF IRON AND STEEL RAILS IN
1881.**
Large as was our production of rails in
1880, the production of 1881 was very much
larger. We give below, in both net and
gross tons, the total rail product of each of
the last four years:

1878.	1879.	1880.	1881.
-------	-------	-------	-------

Net tons..... 882,685 1,913,271 1,461,877 1,844,100
Gross tons..... 988,111 2,033,993 1,595,212 1,946,518

The increase in the rail production of 1880
over 1879 was 348,564 net tons, or 311,219
gross tons, whereas the increase in the rail
production of 1881 over 1880 was 382,263
net tons, or 341,306 gross tons. The record
of the last three years is really marvelous,
and in no other country could it have been
possible. In 1881 we more than doubled
the rail production of 1878, the product of
1881 being 961,415 net tons, or 858,407 gross
tons, larger than that of 1878. The produc-
tion in 1880 was 31 per cent. greater than
that of 1879, and the production of 1881 was
26 per cent. greater than that of 1880. The
total rail production of 1881 was as follows,
compared with the production of 1879 and
1880, net tons being used.

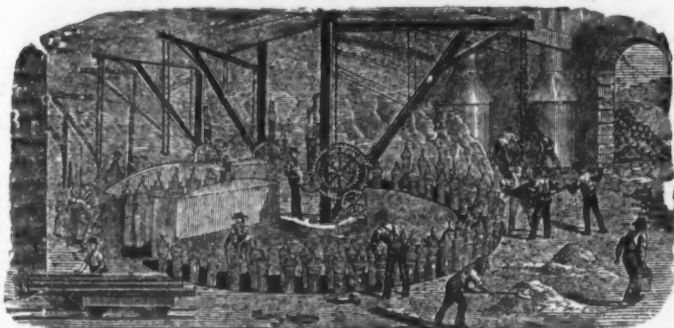
Kind of rails.	1879.	1880.	1881.
Iron rails	420,160	493,768	468,585
Bessemer steel rails	683,954	954,460	1,330,308
Open-hearth steel rails	9,149	13,615	25,217

Total..... 1,113,273 1,461,837 1,844,100
The increase in the production of Besse-
mer steel rails in 1881 over 1880 was 375,842
net tons, or 39 1/2 per cent., and the increase
in the production of open-hearth steel rails
was 11,602 tons, or 85 per cent. In the
production of iron rails in 1881 there was a
decrease of 518 net tons upon the produc-
tion of 1880, or about 1 per cent.

The production of iron rails in this
country must henceforth be annually less
than in either of the last two years.
Iron rails cannot hereafter be made by
our manufacturers in competition with
steel rails, except under favorable cir-
cumstances, the principal favorable cir-
cumstance being the comparative cheapness
with which old iron rails may be rerolled at
iron rail mills located in sections of the
country where there are no steel rail mills.
Their manufacture culminated in 1872, from
which year it steadily declined until 1879,
in which year, and in the two following years

A. H. McNEAL, BURLINGTON, N. J.

Flange Pipes



General Foundry Work.

CAST IRON PIPES FOR WATER AND GAS.

ESTABLISHED IN 1848.

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HAMMERED AND ROLLED

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Warranted Equal to any Produced.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives, Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Muley, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws, Stamping Gold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafts, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

"Iron Center" Cast Plow Steel.
"Soft Steel Center" Cast Plow Steel.
"Solid Soft Center" Cast Plow Steel.

Finished Rolling Plow Casters with Patent Screw Hubs attached.
Agricultural Steel cut to any pattern desired.
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Tool, Machinery and Spring Steel Castings and Forgings.

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For every kind of service, including Street, Mine and Lumber Trains. Wheels furnished in rough bored or on axles. Chilled castings made to order.

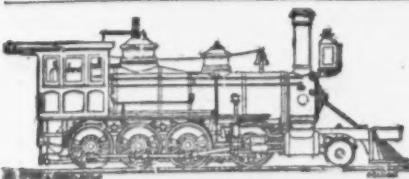
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Forgings for Piston Rods, Guide Bars, Wrist Pins and Machinery Purposes.

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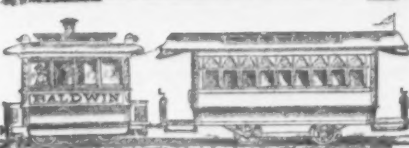
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For city and suburban Railways.

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and draw additional cars. Circulars with full particulars supplied.

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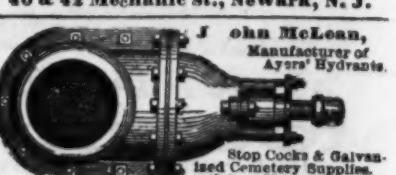
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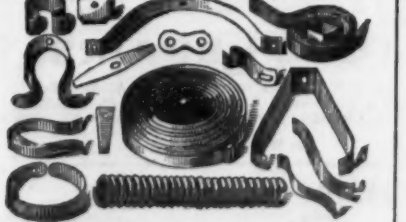
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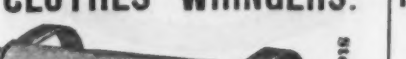
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Patent Rubber Buckets,
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11. It does not obstruct the view.
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13. It provides perfect protection to crops.
14. Ease and quickness with which it can be put up.
15. It is the only fence that will keep stock off railroads.
16. It is the only fence that can be made "hog tight, horse high and bull strong."
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there was a partial recovery in consequence of the inability of steel rail manufacturers to supply the demand for their product. This inability no longer exists. The following table gives the production of iron rails in the United States in each of the last 12 years, in net tons.

1870.	1871.	1872.	1873.	1874.	1875.
586,000	737,483	905,038	761,062	584,469	501,649
1876.	1877.	1878.	1879.	1880.	1881.
467,168	332,540	322,890	420,160	493,702	488,581

Included in the production of 1,330,302 net tons of Bessemer steel rails in 1881 were 77,173 net tons which were produced mainly, but not entirely, from imported blooms. Eleven mills in Vermont, New York, Pennsylvania, Ohio, Tennessee, Illinois and California rolled Bessemer steel rails from purchased blooms. A few other mills have engaged to roll rails from imported blooms in 1882. The business, however, can not be expected to increase largely, if, indeed, it does not actually decrease from this time forward. The following table shows the production of rails of all kinds, by States, in the order of their prominence, in 1881.

States.	Net tons.	States.	Net tons.
Pennsylvania.....	89,179	Kentucky.....	5,005
Illinois.....	131,480	Georgia.....	4,000
Ohio.....	133,596	West Virginia.....	3,159
New York.....	109,283	Massachusetts.....	2,622
Missouri.....	64,226	Alabama.....	2,300
Indiana.....	44,545	Maine.....	2,163
Wisconsin.....	41,165	Colorado.....	1,543
Tennessee.....	32,660	Virginia.....	640
Kansas.....	10,016	New Jersey.....	244
Vermont.....	15,300		
Wyoming Terr.....	11,886		
California.....	6,035	Total.....	2,844,100

The capacity of the Bessemer and open-hearth steel rail mills of the country is now much larger than it was a year ago, and is more than equal to the present demand. If necessary, we could produce in 1882 not less than 1,500,000 gross tons of steel rails, but it is doubtful whether our product during the year will materially exceed that of 1881.

The production of street rails in 1881, which is included in the total production for the year, amounted to 21,554 net tons, of which 12,464 tons were of iron, 7990 tons were of Bessemer steel, and 1100 tons were of open-hearth steel. The production of street rails in the eight preceding years was as follows: 1873, 9430 net tons; 1874, 6739 tons; 1875, 16,340 tons; 1876, 13,086 tons; 1877, 7015 tons; 1878, 9229 tons; 1879, 8646 tons; 1880, 16,894 tons.

In previous reports it has been necessary to state that a few tons of steel-headed rails were annually included in the production of iron rails. In 1881 no rails of this character were reported to us. The following table will show approximately the consumption of all kinds of rails in this country from 1867 to 1881, in net tons:

Years.	Made in United States.	Imported.		Approximate consumption.
		Iron.	Steel.	
1867.....	462,108	163,049		625,157
1868.....	506,714	250,081		756,795
1869.....	593,586	313,161		906,747
1870.....	620,000	390,153		1,010,153
1871.....	775,731	516,202		1,291,933
1872.....	1,000,000	381,064	149,785	1,530,850
1873.....	800,077	96,301	150,571	1,046,949
1874.....	799,411	7,706	100,515	907,632
1875.....	702,314	1,174	18,274	811,662
1876.....	870,659	387	None	871,046
1877.....	754,700	None	35	754,735
1878.....	832,685	None	10	832,695
1879.....	1,113,273	10,000	25,057	1,148,330
1880.....	1,461,517	132,459	158,230	1,752,206
1881.....	1,844,100	137,013	249,309	2,230,422

In round numbers we may be said to have consumed 2,000,000 gross tons of rails in 1881. To fully realize how enormous is this consumption, a simple calculation will show that these 2,000,000 tons are sufficient to lay a single track 22,727 miles long with 56-lb. rails. Or, in default of fuller information, we may compare our consumption of Bessemer steel rails alone in 1881 with that of some other country in the same year. Of the production of 1,023,740 gross tons of Bessemer steel rails by Great Britain in 1881 there were exported 594,419 tons, leaving 429,321 tons for home consumption. The United States, however, imported 222,597 gross tons of steel rails (probably all Bessemer) in addition to the 1,187,770 gross tons of Bessemer steel rails procured at home, thus making its total consumption of these rails 1,410,367 tons. The United States in 1881, therefore, used 981,046 tons of these rails more than Great Britain.

Comparative Rates of Wages in the United States and England.

The Secretary of the Treasury has just transmitted to the Senate of the United States a report, prepared by the Chief of the Bureau of Statistics, on the subject of wages in the United States and in foreign countries, requested by Senate resolution of recent date. In reference to the rates of wages paid and the detailed cost of making pig iron in Pittsburgh and in England in 1879, the latest information he has, Mr. Weeks, who prepared a statement on the subject at the request of the Chief of the Bureau, says that from his information the cost in this country, compared with the cost in England, would be relatively greater now than in 1879, and submits the following, showing relative daily wages paid workmen about blast furnaces in England and at Pittsburgh in that year:

Occupation.	Pittsburgh.	England.	
		Cumberland.	Cleveland.
Chargers.....	\$1.60	\$0.99	\$1.40*
Fillers.....	1.40	.99	.80
Keepers.....	1.20	1.22	1.87*
Keepers' helpers.....	1.80	.77	.73
Laborers.....	1.20*	.50	
Blacksmiths.....	2.00	1.15	
Engine men.....	2.00	1.09	1.02
Total cost of labor per ton of pig.....	1.85	.58½	.69

The total cost of labor per ton of pig iron was as follows:

	Pittsburgh, Pa.	England.
At Pittsburgh, Pa.....	\$1.25	
In Cumberland, England.....	.58½	
In Cleveland, England.....	.69	

The table below shows the cost of pig iron

*Either these are mistakes, or the work is different from that done by "chargers" and "keepers" in Cumberland.

in the Cleveland district, England, for one-half year to March 31, 1879. (All the minerals are given at about cost price. The company own and raise their own minerals):

	Quantity used.	Prices at works.	Cost per ton of iron.
Ironstone.....	Tons. Lbs.	\$0.975	\$3.25
Coal (calcining).....	3 210	.11	
Coke.....	1 203	2.56	2.79
Limestone.....	1 151	.89	.45
Total.....			\$6.55
Wages.....			.69
Stores and repairs.....			.17
Rates and taxes.....			.08
Total.....			\$7.49
A reduction of about 5 per cent., or say.....			.37
Will give (July, 1879) cost.....			\$7.12

The cost of a ton of pig iron at the furnaces in the Pittsburgh district in the first part of 1879 is stated to be as follows:

	Quantity used.	Prices at works.	Cost per ton of iron.
Ironstone.....	Tons.	\$0.90	\$15.39
Coal calcining.....	3 7	1.25	
Coke.....	1 85	2.56½	2.25
Limestone.....	.75	1.15	.71½
Total.....			\$19.29
Wages.....			2.25
Stores and repairs.....			.30
Taxes.....			.10
Total.....			\$21.97

The wages to produce one ton of iron in Pittsburgh is given at \$5.18, against \$3.05 to \$3.17 in England. The royalties on ores, coal and limestone amount to \$1.04.8, against 65 cents in England. The transportation on raw materials is given at \$10.27½, against \$1.53 in England.

In a statement, on the authority of Mr. James M. Swank, in regard to the wages paid for puddling iron, the prices at Pittsburgh for puddling or boiling iron, May 30, 1881, were fixed at a minimum of \$5.50 per ton, to be advanced if prices advanced beyond 2½ cents a pound. Of this sum the puddlers' helpers received about one-third. At Philadelphia, July 24, 1880, the minimum price was fixed at \$4, and is still at that figure. These represent the wages in the two sections. In England the same class of workmen, August 1, 1881—a period of prosperity and good prices—received 7/ or \$1.75 per ton. The wages of other rolling-mill workmen correspond with the wages of puddlers in both countries. These figures require no comment. It is but necessary for the working classes to note the difference in the value of their labor in the United States and England in order to appreciate the importance of sustaining the interests of protection.

The Basic Process.

Mr. W. M. Henderson, an engineer in the employ of the Pennsylvania Steel Company, at Steelton, Pa., is reported to have perfected an exceedingly simple method of renewing the linings of converters adapted to the basic process. The improvement consists in turning the ordinary pillow blocks, in which the converter trunnions revolve, into wheels about 30 inches in diameter, by means of which the converter may be run in and out of working position for use and for repairs, the track consisting of the girders usually provided. It is said that a 10-ton converter empty of metal, with the bottom removed, and weighing about 30 tons, can be wheeled away by two men at the rate of about 25 feet per minute, for which purpose a power truck is provided, geared five to one, with winch handles. The invention has been secured by patent in this country as well as in England, France, Belgium and Germany. It dispenses with the necessity of having an intermediate ladle and crane between the converter and the ingot ladle to get the charge down to the working level. A special hydraulic lift for raising and lowering the shells is superfluous, and room is provided underneath the converters for the introduction of the gas main and pipes to rapidly dry the converters after relining. Another advantage is the ease and rapidity with which a converter can be set free for removal, and replaced by another in working condition, by simply removing two suitable appliances, which lock the wheels of the truck in working position. The importance of having some rapid method of changing converters will probably be best understood when we consider that the lining of a basic converter must be renewed about every 60 hours, and as this work would occupy from 15 to 20 hours of time, its rapid removal would be of appreciable value so far as the output of the establishment is concerned.

The Eddystone Lighthouse.—The new Eddystone Lighthouse, which was erected to replace Smeaton's old structure, was recently lighted by the Duke of Edinburgh, almost three years after he laid what is called the first stone. The original lighthouse built by Smeaton was completed in 1759, and its removal was deemed necessary because the foundation was undermined to such an extent as to render it extremely unsafe. It was at first proposed to remove the Eddystone rocks completely when the Smeaton tower was condemned, as it was thought that this would render a lighthouse unnecessary. The Trinity Board, however, considered that it was not simply to indicate that there was a rock beneath its light, but was important as providing an essential link in the chain of channel lights. The new tower was, therefore, built under the superintendence of Mr. N. Douglass, and is essentially of the same character as Smeaton's, the different heights of the latter being as follows:

	Ft.	In.
The six foundation courses.....	8	4½
The eight courses to entry door.....	13	¾
The 10 courses of well-hole to store-room floor.....	25	2½
Height of four rooms to balcony floor.....	34	4½

Total..... 70
The new tower is 130 feet high, and is built

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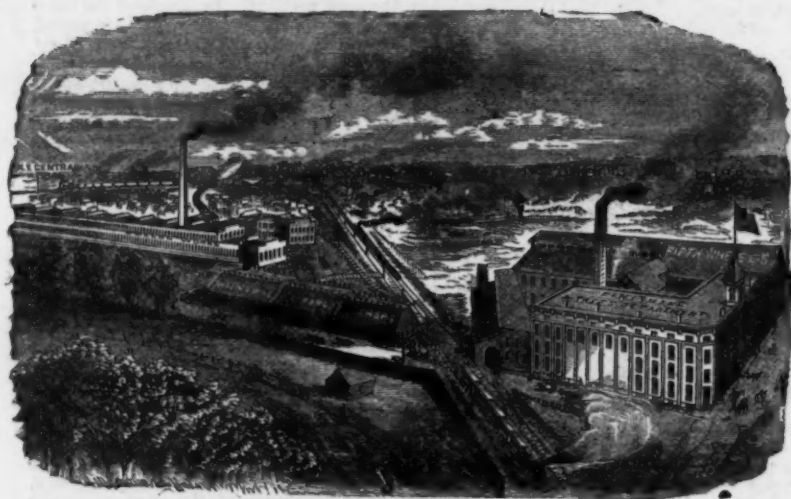
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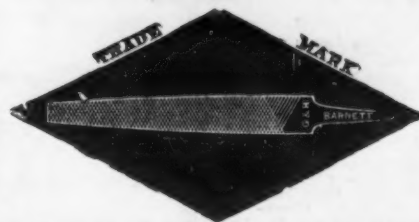
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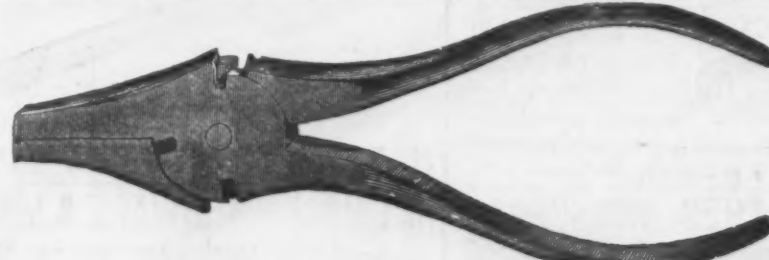
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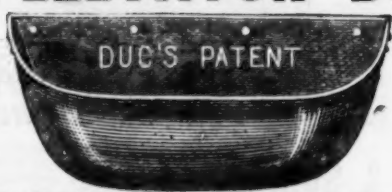
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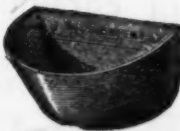


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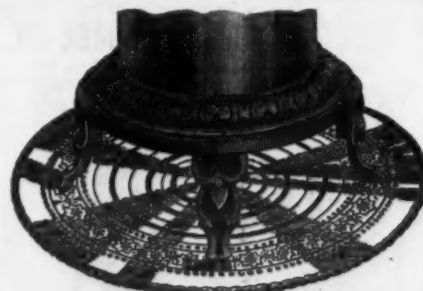
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Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discount.
Packed 12 in each case.

Out Showing Round Platform.

PURE ELECTRIC WIRE,

Manufactured by the

ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Splittorff's patented Liquid Insulation, covered with cotton or silk. All sizes of Bare and Covered Wire in Stock. The conductivity of every bundle tested and warranted.

THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Patches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

ESSEX HORSE NAILS.

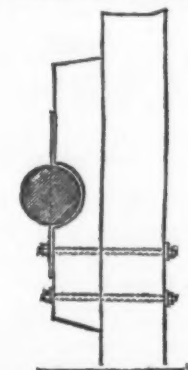
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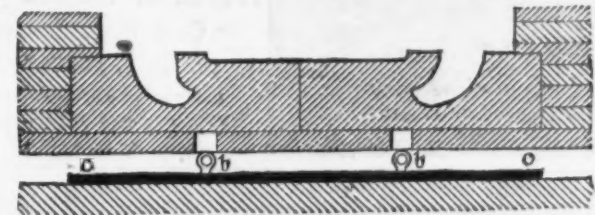
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It is announced that the Jones mines, located near Joanna, Berks County, which are operated by the Phoenix Iron Co., of Phoenixville, have suspended operations. Some 40 miners were employed at the works, and the fires were drawn yesterday. The accumulated stock of ore and a decreased demand for pig iron is said to be the cause.

The Moslem Furnace, in Richmond township, Berks County, which had been lying idle for some time, undergoing repairs, is now ready to blow in, and a stock of material is being provided.

The mine of the Lehigh and Wilkesbarre Coal Company is on fire; 100 men are engaged in fighting the flames. At the time the fire was discovered a large number of miners were in the shaft, and were compelled to travel through abandoned workings in order to make their escape.

AUBURN FILE WORKS,

Superior Hand-Cut
FILES AND RASPS,
MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.
FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y.

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For Superiority.



PENNSYLVANIA FILE WORKS,

Philadelphia, Pa., U. S.

Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

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P. O. Box 1049.

113 Chambers and 95 Reade Streets, New York.

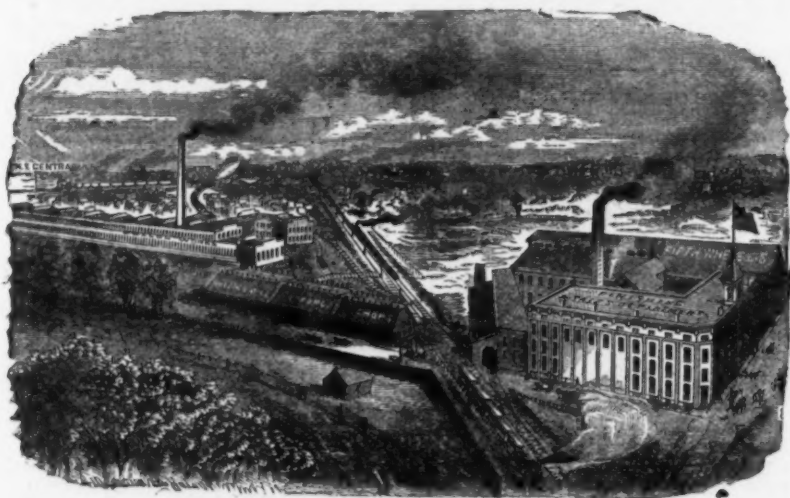
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Thompson, Derby & Co.,
Scythe Snaths
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H. Knickerbocker,
Scythes, Axes and Tools
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Iron City Tool Works, Ld. Vices,
Picks, Mattocks, Grub Hoes, &c.
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Wheeling Hinge Co.,
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Butter and Flour Triers, etc.
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Plymouth Tack and Rivet Works.
Carr, Crawley & Devlin,
Miscellaneous Hardware & Cast Butts.
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Cast Steel Shears and Scissors.
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WITH MOVABLE COPPER TYPE.

Gives better satisfaction, brands all articles sharper and deeper, and lasts longer than any other kind of BRANDING IRON EVER MADE. Any Name or Number can be furnished in 1/4 in., 3/8 in., or 1/2 in. sizes. They are compactly and MECHANICALLY constructed, and can be taken apart or put together again in a minute's time.

Liberal discount to the trade.

ASA FARR, 64 College Place, New York.

MOLDING SAND AND FOUNDRY FACINGS.

OUR STOVE PLATE FACING IS INDORSED BY THE LEADING STOVE FOUNDERS

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Office of FULLER, WARREN & CO.,

Troy, N. Y., February 21st, 1882.

To Whom it May Concern:

We have during the past four months used about 75 barrels of the "WHITEHEAD STOVE PLATE FACING," and find it the best and most economical that we have ever had in our Works, and shall continue to use it while supplied with the present quality. This Facing is manufactured by the AMERICAN FACING CO., 315 West 15th Street, New York City.

A. H. EATON, Superintendent.

SHOVELS, RIDDLES, BRUSHES, &C.

WHITEHEAD BROS.
AMERICAN FACING CO.WM. WHITEHEAD, Treas.,
517 W. 15th St.,
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TUFTING BUTTON

PATENTED June 28, 1881.

THE AMERICAN TACK CO., Fairhaven, Mass.,

Are making TUFTING BUTTONS with every Eye Soldered to its Back, giving them great Strength and Durability. All Buttons are guaranteed satisfactory. Also Lining and Saddle Nails, and every variety of

TACKS and NAILS.

New York Salesroom, 116 Chambers Street.

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Bandsaw Files,
Boot Heel,
Brass,
Cabinet,
Cant,
Cotter Taper,
Cotter Equaling,
Cross or Crossing,
Doctor,
Drill,
Feather Edge,
Finishing,
Flat,
Flat Equaling,
Flat Wood,
Gang-Edger,
Ginsaw,
Gulleting,
Half-Round,
Half-Round Wood,
Hand,
Hand Equaling,
Handsaw Blunt,
Handsaw (Double-End),
Handsaw Taper, single cut,
Handsaw Taper, double cut,
Handsaw Taper, slim,
High Back,
Hook-Tooth,
Knife,
Knife Blunt,
Lead Float,
Lightning,
Machine Mill,
Mill,
Mill Blunt,
Mill Pointing,
Pillar,
Pitsaw,
Reaper,
Roller,
Round,
Round Blunt,
Slotting,
Slim Handsaw Taper,
Square,
Square Blunt,
Square Equaling Files,
Stave Saw,
Three-Square Files,
Three-Square Blunt Files,
Tumbler Files,
Union Cut,
Warding Files,
Warding Blunt File,
Warding Round Edge File.

RASPS.

Baker's,
Beveled Edge,
Broad,
Cabinet,
File, Flat and Half Round,
Flat Shoe,
Flat Wood,
Half-Round Shoe,
Half-Round Wood,
Horse, Plain and Tanged,
Horse Mouth,
Jig,
Oval or French Shoe,
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SPECIALTIES.

Butchers' Steels, Improved,
Bent Rifflers, Handled,
File Cards,
File Brushes,
Machinists' Scrapers,
Stub Files & Holder, Detachable.
Surface File Holder,
Vise File Holder.

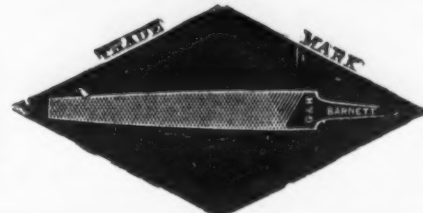
NICHOLSON FILE CO.,

PROVIDENCE,

R. I.,

SOLE MANUFACTURERS.

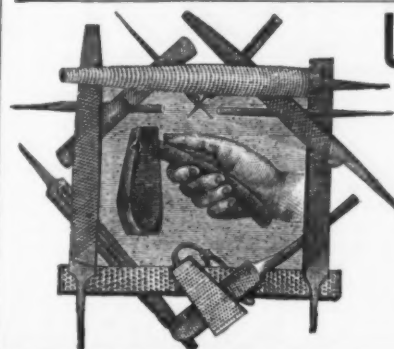
Black Diamond File Works.

Awarded by Jurors of Centennial Exposition, 1876, for
"VERY SUPERIOR GOODS."**G. & H. BARNETT,**

39, 41 & 43 Richmond St., Philadelphia.

CHARLES B. PAUL,

Manufacturer of HAND CUT FILES.

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All descriptions of Files made to order. Price List mailed on application. Established 1863.

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311 to 315 North St.,

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Made from the Best Refined Cast Steel.
With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

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ESTABLISHED 1842.

INCORPORATED 1881.



CHAS. F. CRIPPS, President.

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Manufacturers of the Celebrated

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Fourth and Somerset Streets, PHILADELPHIA.

New York Branch, 125 Chambers Street.

WM. H. BRAMHALL, Manager.

Prices the lowest. Goods the best.

Send for sample order.

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DODGE'S PATENT

FILE FORGING AND FILE GRINDING.

These machines have long been in use in this country and in Europe, and are unexcelled for perfection of work and labor saving. We now offer them with the latest improvements, and will apply them to forging and grinding other articles of tapering or otherwise irregular form.

Works at Woodside, NEWARK, N. J.

THRIFT FILE WORKS,
Manufacturers of all kinds of
Files, Rasps.



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JOHNSON & BRO.
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NORTHWESTERN FILE WORKS,
65, 67 and 69 So. Canal St., Chicago,
Make a specialty of 12 and 14-inch Flat. Will be pleased to hear from parties using the above sizes largely.

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W. C. METZNER,
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Price, \$3.00.

For Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measure or funnel to collect dirt and draw files. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are guaranteed to measure correctly, according to U. S. Standard.

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General Agency, GRAHAM & HAINES, 113 Chambers St., New York.

**J. M. KING & CO.**

WATERFORD, N. Y.,

Manufacturers of the BUTTONS PATENT

"WIRE CUTTER AND PLIER COMBINED."

Specially Adapted for Use on Wire Fence.

Also Manufacturers of

Blacksmith and Machinists' Stocks and Dies, Plug and Taper Taps,
Hand, Nut and Screw Taps, Pipe Taps and Reamers.

Price List on application.

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MANUFACTURERS OF

AMERICAN AND FRENCH WIRE NAILS, TACKS, SHOE NAILS, And Every Variety of Small Nails.

Offices & Factories at Taunton, Mass.

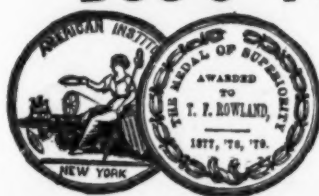
Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

Any variations from the regular size or shape of the above-named goods made from sample to order.

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The Storehouse Bucket, in sizes from 12 to 17 inches.
This Bucket is struck out from the best charcoal iron; consequently is very durable. It requires 50 per cent. less power to run it than the old-fashioned square bucket, and will outwear half a dozen of them. Over 300,000 are now in use by the principal Millers, Brewers, Distillers and Manufacturers at home and abroad. It is the best Bucket made.
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We carry a large stock of the various sizes of *Tinners', Carriage, Wagon, Hame, Belt, Barrel, Safe and Tank Rivets*, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

WILLIAM H. DUNBAR, President.

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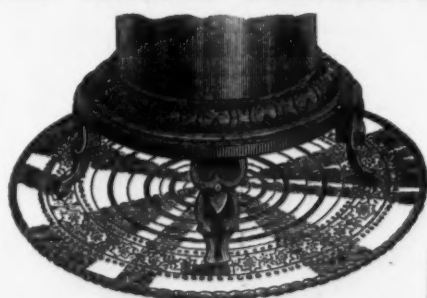
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With Patented O. G. Border.
ROUND ZINC.

27, 30, 32, 34, 36 inch.

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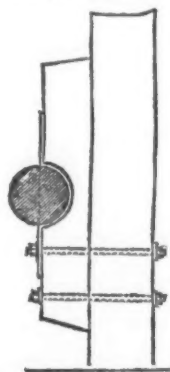
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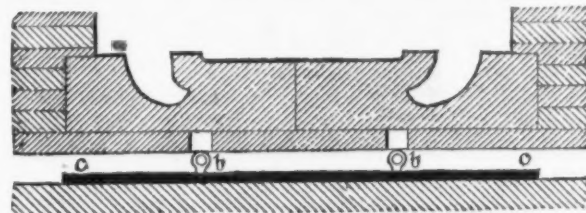
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Messrs. MacPherson, Willard & Co.'s Union Steam Forge, in Bordentown, which employs about 160 hands, and which closed on May 25 on account of the slackness of trade, opened again last week with a slight reduction in the night force.

PENNSYLVANIA.

It is announced that the Jones mines, located near Joanna, Berks County, which are operated by the Phoenix Iron Co., of Phoenixville, have suspended operations. Some 40 miners were employed at the works, and the fires were drawn yesterday. The accumulated stock of ore and a decreased demand for pig iron is said to be the cause.

The Moselam Furnace, in Richmond township, Berks County, which had been lying idle for some time, undergoing repairs, is now ready to blow in, and a stock of material is being provided.

The mine of the Lehigh and Wilkesbarre Coal Company is on fire; 100 men are engaged in fighting the flames. At the time the fire was discovered a large number of miners were in the shaft, and were compelled to travel through abandoned workings in order to make their escape.

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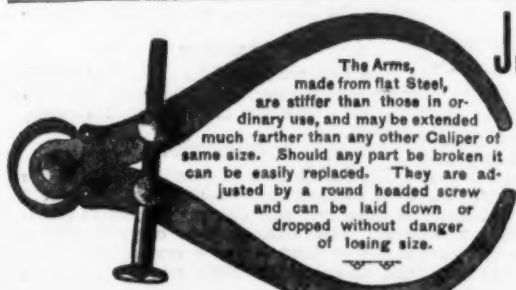
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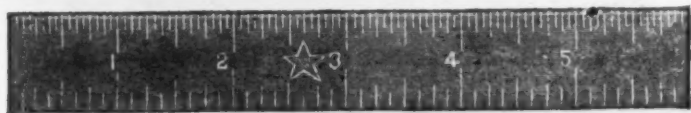
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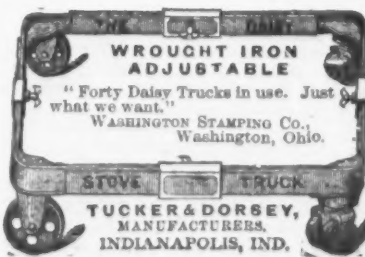
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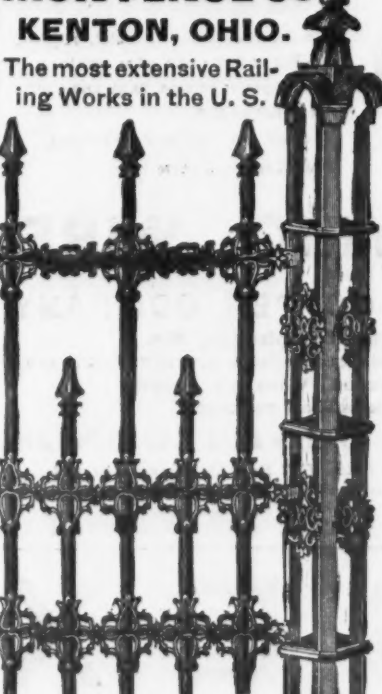
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NO SOLDERING
THE HINGE CANNOT
MELT OFF.

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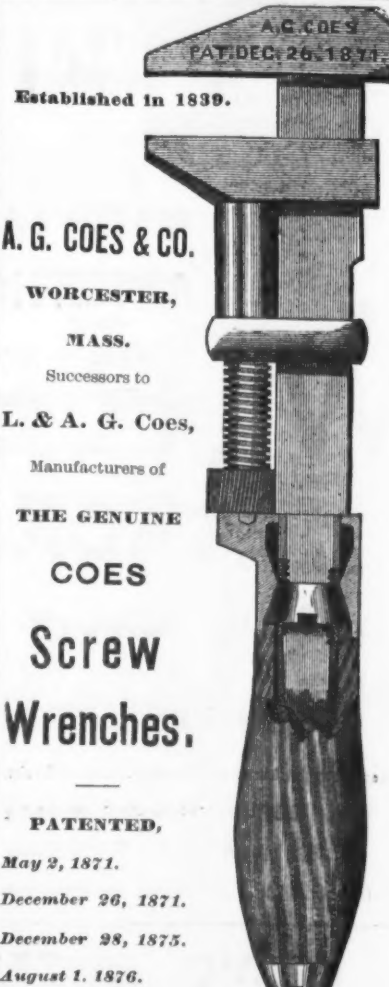
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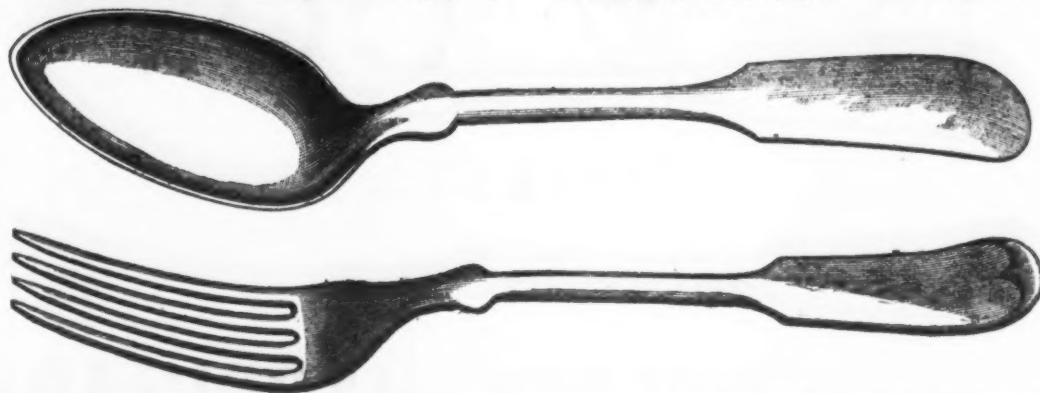
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In addition to Spoons of this well-known brand, we are now prepared to furnish Forks of the same quality. We GUARANTEE these goods to be SOLID and of UNIFORM quality throughout, with no coatings to wear through or flake off, and with no liability to RUST.

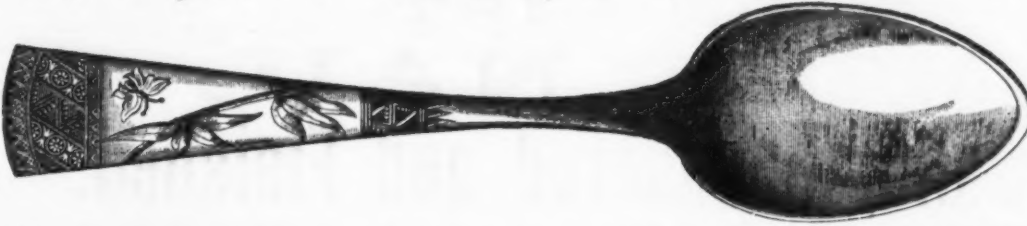
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CAPACITIES FROM 1-8 TON TO 10 TONS,

ONE MAN CAN LIFT 5000 POUNDS.

They Hold the Load Suspended at Any Point.

ALL SIZES IN STOCK.

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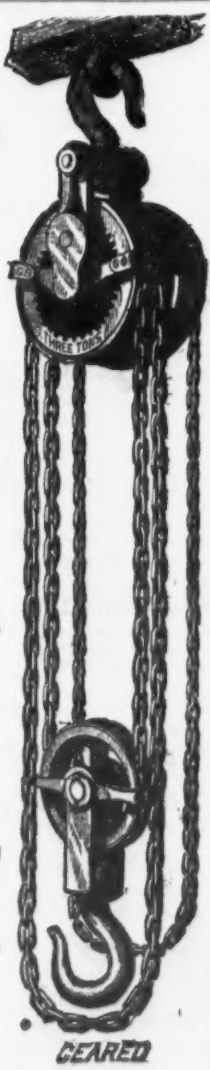
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40 Page Illustrated Catalogue of Light Hoisting Machinery sent on application.



The slate trade continues brisk and the demand is steadily increasing, many of the operators in Slatington being unable to meet the orders. The shipments for the three days ending May 31, were as follows: Roofing slate, 2232 squares; school slate, 193 cases; sawed school slate, 1 car; flagging, 76 pieces.

Work in the Hollidaysburg Foundry and Machine Shop has been suspended for the present. There was no strike in it, however, but one of the many results that will and may be expected to follow the suspension of work in other parts of the State.

Topton Furnace, which has been out of blast since last March for repairs, has been placed in first-class condition. The stack is being filled, and at an early day the match will be applied and the furnace will once again be in blast.

Negotiations that have been pending for the past week for the transfer of the large machine shop and foundry, the property of George W. Snyder & Co., of Pottsville, to the P. & R. Co., have been completed. The employees have gone to work under the new management. All contracts on hand unfinished by Snyder & Co. will be immediately filled, after which the shops will be kept running on colliery repairs.

No. 1 Aetna Furnace, at Newcastle, has been blown out for repairs.

At the furnace of the Warwick Iron Company, for the week ending June 3, 407½ tons of pig iron were manufactured.

Work was commenced at Lebanon last week on the first building of the Pennsylvania Bolt and Nut Company. It will be a frame building, 60 x 120 feet, to be used as a rolling mill, located next to the pipe-mill grounds. It is calculated to have it under roof in 90 days. All the other buildings are to be of brick, as follows: Nut and bolt factory, 80 x 120 feet; boiler house, 30 x 40 feet; burring room, 40 x 60 feet; machine shop, 60 x 120 feet; and a three-story brick warehouse, 50 x 150 feet.

The old Agricultural Works, at Rochester, were burned down on June 4. The Olive Stove Works, immediately adjacent, were damaged to the extent of \$2000, which loss is covered by insurance. A number of other buildings were destroyed.

Owing to the increased demand for "Chickies" pig iron, the Chickies Iron Co., of Chickies, have contracted with the Conaway's Iron Co., of Middletown, to manufacture this brand exclusively for them and under their direction. As they will now have three furnaces running on the same uniform mixture of ores, it will enable them to more promptly meet the requirements of their numerous customers.

PITTSBURGH AND VICINITY.

An explosion occurred on last Sunday at D furnace of the Edgar Thomson Steel Works, one man being fatally and two others slightly injured.

Ripley & Co., glass manufacturers, have completed the stack of their new furnace. They are now busily engaged in completing the balance of the structure.

Schoenberger & Co. stopped one of their blast furnaces last Saturday night, and expect to stop the others shortly.

Thomas Coffin & Co., glass pot manufacturers, receive orders enough to keep them busily engaged; they have several new furnaces on hand now, both here and in the West, and they are working steadily on these and other contracts.

OHIO.

The Mingo furnaces, at Mingo Junction, have been banked up on account of the labor troubles. The building of the company's new mill works will be completed during the coming autumn.

Phoenix Furnace, of Brown, Bonnell & Co., at Youngstown, made during its last blast of 240 weeks, 86,064 tons of metal. The blast extended from November 3d, 1877, to June 3d, 1882, when it was blown out. The furnace measures 15 x 60 feet.

The works of the Youngstown Malleable Iron Company have started up again under new management. Arrangements have been made to increase the capacity for production of the establishment, ground having been broken for a new addition 70 feet wide and 150 long. In addition to filling orders for the jobbing trade, the concern will manufacture the following goods: Lambert's malleable iron folios, Oviatt's "Common Sense" riser and lock, and the New York "German" and "Victor" harness snaps. With the new addition completed and the establishment running full it will furnish employment to 125 persons.

It can now be said to a certainty that the Standard Coal and Iron Company have materialized, and that every arrangement has been made for the company to commence active operations by the 1st of July. The general manager of all the furnaces and iron interests will be Walter Crafts, and the coal property and its production will be under the supervision of T. Longstreth, of this city.—Columbus Dispatch.

The Ohio Falls Car Works have closed down for lack of work—600 men are out of employment.

The Forsyth Scale Works, Youngstown, are running in all departments with the exception of the foundry.

Taplin, Rice & Co., Akron, who employ 150 hands, have purchased the Sieberling Machine Works, which are now in running order.

The Anson Wood Reaper and Mower Works, Youngstown, have shut down on account of the scarcity of malleable iron—a result of the strike.

The frame for the factory of the Union Glass Works, Martin's Ferry, is up and the rear walls are about completed. The factory will be ready for the iron roof by Monday week.

The Lechner Mfg. Co., of Columbus, manufacturers of the Lechner mining machines and anti-friction roller detachable chains for transmitting power, are very busy, and are at this time working upon some good orders for both the chains and mining machines.

Messrs. Johnson Bros. & Luper, of Cincinnati, are about embarking in the hardware jobbing business, and are making preparations to largely increase their present business. They are handling the Westphal patent screw case, and Porter's window and door screens.

The rolling mill crayons and metal work-

ers' crayons made at the works of D. M. Steward, of Cincinnati, are meeting with quite a large sale, and are superseding the "French chalk" which was used to some extent previous to the commencement of the works of Mr. Steward. Over 40 of the rolling mills of this country are using these crayons, which are found to give entire satisfaction.

According to contracts recently closed with several large engine builders, by the Miller Company, of Canton, the "Torrent" and "Unique" steam pumps will be used in connection with the agricultural and sawing engines turned out by such firms. The Miller Company have also provided the Sibley College of Mechanic Arts of the Cornell University with one of their new "Unique" pumps as a means of illustration and instruction. On account of the increased demand for the different sizes of these pumps, the company contemplate the erection of extensive additions to their works, plans for the same now being under consideration.

ILLINOIS.

Weir & Craig have just added to their works a new boiler and \$3000 worth of machinery in order to enable them to keep up with their orders. They have also doubled the capacity of their pattern shop and brass foundry by an addition of 55 x 33 feet, three stories, brick, and are placing a number of improved furnaces in their brass foundry.

Macfarren, Levy & Co. have just added to their works a heading, shaping and cutting-off machine, and report a brisk trade on brush machines and speed lathes. They are about completing two 17-inch engine lathes for their own use.

MICHIGAN.

The following table exhibits, in gross tons, the total lake shipments of iron ore from Upper Peninsula ports the present season, up to and including May 31, together with the amount shipped during a corresponding period last year:

Name of port.	1881.	1882.
Escanaba.....	159,081	316,066
Marquette.....	45,063	164,376
L'Anse.....	2,793	8,186
St. Ignace.....	.....	2,812
Total.....	207,937	491,440

Showing an increase of 283,503 tons.—Marquette Mining Journal.

LABOR AND WAGES.

The journeymen horseshoers of Chicago have gone out on a strike, to the number of 350. They demand the use of machine-made shoes and 25 cents per day advance.

The gas furnace men at the Union mills of Carnegie Bros. & Co., are still out on strike for an increase of \$2 per week.

The striking employees of the South Wareham Nail Company, at South Wareham, Mass., have received 10 per cent. advance, and will return to work on Monday.

The Schuykill Coal Exchange has just issued the following circular:

POTTSVILLE, June 3, 1882.

The following collieries, drawn to furnish prices of coal, to determine rate of wages to be paid in May, 1882, make the following returns as the prices for that month:

Mahanoy City Colliery (P. & R. C. & I. Co.).....	\$2.41
Girard Colliery.....	2.37
Gilberton Colliery.....	2.37
Freston No. 1 Colliery.....	2.43
Cuyler Colliery (S. M. Heaton & Co.).....	2.36 74-100

The average of these prices is \$2.39 95-100, and the rate of wages to be paid in May, 1882, is 5 per cent. below the \$2.50 basis.

The roll turners of the Pittsburgh district held a meeting on Saturday night to talk about organizing a protective association, but nothing was done definitely.

Owing to the superintendent of the pipe mill at the Reading Iron Works, Reading, Pa., having put up a notice requiring the tubes to be worked up properly and the floors kept clean, so that no imperfect pipe would be left over for the next turn to finish, the men at two of the welding furnaces stopped work on Thursday last, and in the evening the company issued orders that the mill be run with only a single turn until further notice. The next morning about 50 of the employees held a secret meeting and determined to make the following propositions to the company: Changing from piece to day work; no man to be responsible for another man's work; every man wants a set day's work; welders want \$5 a day; first straighteners, \$2.50; rodmen and revolvers, \$2.20; crab tenders, \$1.75; second straighteners, \$2.20; first firemen, \$3; and second firemen, \$2. A committee was appointed which waited upon Superintendent Wolf and presented the demand, desiring an answer by Tuesday evening. There is also complaint that the employees are kept waiting from half an hour to an hour each day for their time checks. The mill is now running on a single turn in day time only.

A large number of miners have been put to work at Cumberland, Md. Some trouble has been occasioned by the refusal of some of the trainmen to haul coal mined by the new hands, but this difficulty has been arranged.

The Tamarack Swamps, near Sharpsville, Pa., appear to be a serious obstacle to the work of the New York, Pennsylvania & Ohio Railroad Company, who undertake to lay a solid road-bed across them. In commencing operations a few thousand cubic yards of soil were dumped upon the surface, this quantity being deemed sufficient for all purposes. When the earth, however, immediately disappeared and left no trace behind, it was evident that additional material was necessary, and the Company accordingly purchased from a furnace the cinder which had accumulated during a period of 10 years. Within the past few months some 5000 car-loads have been utilized without producing any visible result. Occasionally at night there are evidences of repletion, but in the morning the water presents an unruffled surface without any appearance of having been disturbed. A solid road bed could be laid close by, entirely avoiding the swamp, but it appears that the Company have determined to carry out their original plan notwithstanding all opposing difficulties.

H. D. SMITH & CO..

Plantville, Conn.,

Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

SARANAC HORSE NAIL CO.

Polished or Blued Horse Nails, Hammered and Finished.

The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

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SARANAC HORSE NAILS,

Blued or Polished.

Terms, Cash, within 60 Days.

Nos. 5 6 7 8 9 10
Cts. 26 23 21 20 19 18

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BREECH LOADING GUNS.



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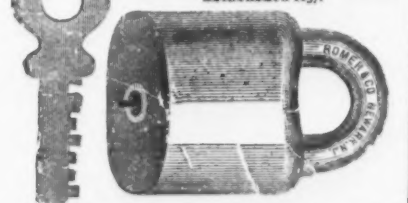
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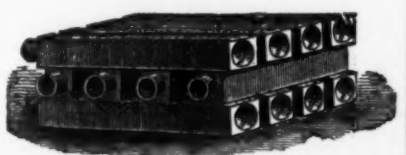
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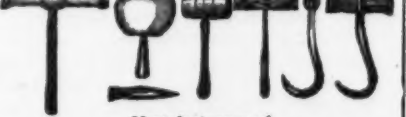
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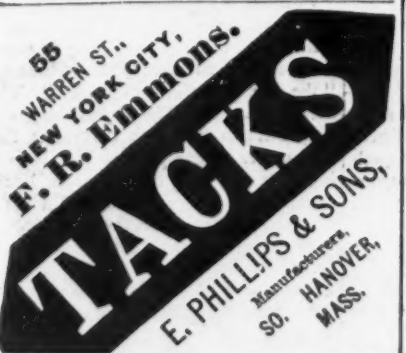
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This company manufactured the immense DRIVING and ELEVATOR BELTS for the Buckingham Elevators at Chicago, which have been running perfectly for more than Twelve Years, also those for the Dole & Co. of Chicago, Vanderbilt's Elevators for the N. Y. Central & Hudson River R. R. the great Elevators of the P. & E. Railroad, of Jersey City and Hoboken, Dow's Stores, of Brooklyn, and many others; in fact, the largest Belts for the largest Elevators in the world. A single carrier belt in the P. & E. R. Elevator is over 2000 feet long, weighing 15,000 pounds, and has run perfectly from the start.

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The properties of these Wheels are such that they can be used with great advantage and economy for cutting grinding, and finishing Wrought and Cast Iron, Chilled Iron, Hardened Steel, Slate, Marble, Glass, etc. These wheels are extensively used by manufacturers of Hardware, Cutlery, Edge Tools, Pumps, Saws, Stoves, Fire Arms, Wagon Springs, Axles, Skates, Agricultural Implements, and small Machinery of almost every description.

Pat. Jan. 16, 1880.

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Rubber Back Square Packing

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For Packing the Piston Rods and Valve Stems of Steam Engines & Pumps. B represents that part of the packing which, when in use, is in contact with the Piston rod. A the elastic back, which keeps the part B against the rod with sufficient pressure to be steam tight and yet creates but little friction. This Packing is made in lengths of about 20 feet, and of all sizes from 1/4 to 2 inches square.

Pat. 11,208, 213,602

For Halls, Flooring, Stone and

Iron Stairways, &c.



RUBBER MAT

This practical and indispensable article—especially for wear where exposed to ice, snow or slush—was first introduced by this company several years ago, and its real value is in being almost indestructible, when proper materials are used in its manufacture, whilst the cheap inferior quality forced on the public by reckless imitators of our patent goods soon becomes brittle and crumbles to pieces. Address

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H. P. GREGORY & CO., San Francisco, Cal., General Agents for Pacific Coast.

The Manufactures of Twenty Principal Cities.

The Superintendent of the Census has recently issued his report of the statistics of manufactures of the cities named below during the census year June 1, 1879-May 31, 1880. Iron and steel includes the products of blast furnaces, rolling mills, steel works, bloomaries and forges. Iron castings includes the products of foundries making iron castings for architectural and ornamental purposes, stoves, heaters and hollow-ware, and such castings for machinery as are sold in an unfinished condition:

question was ordinary rail steel of about the following composition:

Carbon.....0.35 Silicon.....0.05
Phosphorus.....0.08 Sulphur.....0.05
Manganese.....0.98

The samples for manganese determinations were taken at first from an average of two days' work, and later on, when the steel rolled badly, from single "blows," which were considered to fairly represent the condition of the steel at the time. In regard to the mechanical condition and treatment of the steel, it was made just as usual, even more care being taken with the mixtures, the casting and every detail of manufacture

	No. of Establishments	Capital.	Hands.	Wages.	Materials.	Product.
Baltimore.....	3,596	\$35,760,108	.....	\$14,467,852	\$46,468,244	\$75,621,388
Iron and steel.....	10	1,632,125	1,408	532,579	1,803,209	2,672,940
Castings.....	22	1,001,742	1,196	419,088	705,254	1,452,976
Boston.....	3,521	42,750,134	.....	23,715,140	77,586,607	123,366,137
Iron and steel.....	5	1,624,408	1,120	444,095	1,552,002	2,189,987
Bolts, nuts and washers.....	3	30,000	43	21,066	17,000	54,000
Castings.....	20	589,000	778	308,962	461,302	894,509
Forgings.....	3	420,000	285	107,779	250,947	502,970
Brooklyn.....	5,089	56,621,399	.....	21,072,051	124,951,203	169,757,590
Iron, bolts, nuts, washers and rivets.....	12	114,899	172	43,456	103,552	185,245
Castings.....	30	1,300,200	1,557	750,458	939,156	2,138,059
Railings, wrought.....	15	73,147	122	53,468	56,748	141,897
Buffalo.....	1,137	24,188,562	.....	6,913,702	25,888,263	40,003,205
Iron and steel.....	4	1,790,000	713	212,278	635,353	887,012
Castings.....	6	1,620,000	943	363,000	983,464	1,500,254
Forgings.....	3	255,000	260	69,000	225,000	400,000
Chicago.....	3,479	64,177,335	.....	33,795,486	175,244,364	241,045,607
Iron and steel.....	11	3,875,000	2,871	1,477,563	8,006,970	10,441,891
Castings.....	30	2,382,400	2,409	1,120,544	2,738,222	4,375,993
Doors and shutters, wrt... Forgings.....	3 4	7,500 135,800	18 115	11,720 56,130	19,800 349,337	40,560 485,581
Railings.....	5	10,000	27	15,590	17,400	42,882
Ironwork, architect'al,&c Cincinnati.....	11 3,231	64,000 43,278,732	133	68,294 18,571,687	170,900 55,939,133	303,900 94,869,105
Iron and steel.....	4	610,689	313	163,590	338,479	596,160
Iron castings.....	28	1,774,650	2,032	917,413	1,155,000	2,520,162
Railings.....	5	18,150	83	24,183	32,969	69,386
Work, architectural and ornamental.....	7	20,250	77	29,025	52,124	105,847
Cleveland.....	1,033	18,134,789	.....	8,377,081	30,850,977	47,352,208
Iron and steel.....	10	2,839,042	2,999	1,960,237	6,491,506	9,435,432
Bolts, nuts, washers and rivets.....	5	307,500	455	153,923	482,926	860,711
Castings.....	16	1,162,838	2,040	660,594	1,336,230	2,685,125
Forgings.....	3	305,000	206	86,500	323,000	523,000
Railings, wrought.....	4	28,200	25	8,885	23,800	45,500
Ironwork, architect'al,&c Detroit.....	3 875	11,500 14,202,159	37	18,840 5,841,426	47,274 17,143,490	84,354 25,303,580
Iron and steel.....	7	1,547,386	1,095	436,986	1,872,407	2,498,634
Castings.....	4	124,000	333	87,816	351,000	531,000
Jersey City.....	555	11,329,915	.....	4,347,034	49,320,099	59,581,141
Iron and steel.....	3	850,000	415	210,000	771,340	1,464,509
Castings.....	10	436,500	270	119,327	308,508	517,597
Railings, wrought.....	3	2,200	12	1,010	1,975	5,900
Louisville.....	1,066	19,583,013	.....	5,496,521	19,180,212	32,381,733
Iron and steel.....	3	392,000	470	149,187	305,784	54,623
Castings.....	15	1,655,250	1,324	443,402	1,056,810	1,795,799
Ironwork, architectural, &c.....	4	33,500	39	12,004	19,940	48,493
Milwaukee.....	821	13,811,405	.....	6,305,487	26,462,740	38,955,138
Iron castings.....	11	440,045	603	191,000	379,217	720,069
Newark.....	1,299	23,919,115	.....	12,809,011	42,940,817	66,234,525
Iron and steel.....	3	600,000	281	126,144	471,946	771,078
Castings.....	9	215,000	404	143,590	255,800	483,500
New Orleans.....	906	8,401,399	.....	3,658,152	10,475,022	18,341,006
Iron Castings.....	8	103,375	245	91,445	134,300	263,800
Ironwork, architectural, &c.....	3	1,800	10	3,477	4,200	14,500
New York.....	11,162	164,917,856	.....	93,378,806	275,097,236	448,209,243
Iron bolts, nuts and washers.....	9	115,090	158	60,849	144,720	249,222
Castings.....	47	3,913,295	4,516	1,830,833	2,227,197	5,494,122
Pipe, wrought.....	7	329,500	164	56,510	468,071	626,065
Railings, wrought.....	20	104,450	231	119,352	146,915	358,170
Philadelphia.....	8,377	170,495,191	.....	60,606,287	187,169,375	304,591,725
Iron and steel.....	16	2,999,245	2,068	1,045,570	2,580,512	4,257,179
Bolts, nuts, washers and rivets.....	10	876,500	1,135	307,581	767,388	1,395,606
Castings.....	39	3,662,610	3,218	1,324,581	1,661,357	3,770,311
Iron forgings.....	10	323,800	364	128,422	323,893	561,487
Nails and spikes.....	4	21,350	19	5,383	17,735	30,518
Pipe, wrought.....	3	616,000	587	92,000	319,000	510,000
Railings, wrought.....	15	100,250	127	35,845	99,648	180,032
Pittsburgh.....	1,071	50,976,902	.....	16,918,326	41,201,998	74,241,889
Iron and steel.....	39	25,190,000	15,632	8,072,110	19,288,063	35,490,634
Bolts, nuts, washers and rivets.....	4	380,000	495	148,709	571,943	867,760
Castings.....	20	1,263,000	1,023	391,802	797,013	1,572,548
Iron forgings.....	5	130,500	111	52,410	86,419	194,387
Pipe, wrought.....	3	869,150	805	196,582	1,187,025	1,558,250
Providence.....	1,186	23,573,932	.....	8,903,729	21,379,467	39,596,653
Iron castings.....	10	1,011,656	731	316,366	349,710	827,216
San Francisco.....	2,860	29,417,246	.....	13,595,010	44,537,436	71,613,385
Iron castings.....	18	871,500	861	397,809	91,823	1,311,743
Forgings.....	4	42,000	57	27,702	47,081	91,310
St. Louis.....	2,886	45,385,785	.....	16,714,917	68,154,990	104,383,587
Iron and steel.....	10	5,960,600	2,268	616,575	2,823,058	3,950,530
Bolts, nuts and washers.....	4	235,000	178	60,498	301,937	493,566
Castings.....	17	2,462,500	1,876	1,035,424	1,589,415	3,526,815
Railings, wrought.....	6	23,400	48	20,760	25,360	63,400
Washington.....	961	5,381,226	.....	3,897,126	5,234,611	11,641,185
Iron castings.....	5	142,000	174	46,740	123,216	282,800
Railings, wrought.....	5	3,275	21	3,912	4,685	13,403

The Iron Age

AND
Metallurgical Review.

New York, Thursday, June 15, 1882.

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JAMES C. BAYLES . . . Editor.
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CONTENTS.

First Page.—Casting an Anvil Bed. Improved
Railway Spring Making Machine.

Third Page.—Iron Statistics for 1881.

Fifth Page.—Iron Statistics for 1881 (Con-
tinued).

Seventh Page.—Iron Statistics for 1881 (Con-
cluded). Comparative Rates of Wages in the United
States and England. The Basic Process. The
Eddystone Lighthouse.

Ninth Page.—Pneumatic Clocks. Industrial
Items.

Eleventh Page.—Industrial Items (Continued).
Labor and Wages.

Thirteenth Page.—The Manufactures of Twenty
Principal Cities. Manganese in Bessemer Rail
Steel.

Fifteenth Page.—The Labor Situation
West. Economy of Fuel in Iron and Steel Manu-
facture. Tin Plates and Brands. Opening Corea
and Anam.

Seventeenth Page.—The Employers' Liability
Act in Great Britain. Expansion in Canada. The
National Exhibition at Turin. The "House of
Lords" and the "House of Commons." Obituary
The National Association of Stove Manufacturers.
New Publications.

Nineteenth Page.—New Publications (Con-
cluded). Washington Notes. Stevens Institute
of Technology. "Mysterious" Boiler Explosions.

Twenty-first Page.—Automatic Trimming and
Squaring Machine. The Iron Ore Resources of
England. Sparks from Cast Iron Gears. Some
Plain Truths about Tin Plates. The Wire Gauge
Controversy. Electrical Exhibition at Vienna.

Twenty-third Page.—Trade Publications. Iron
Mines at Dileite.

Twenty-fifth Page.—Trade Report—British
Iron and Metal Markets. Financial. General. Har-
ware. Iron.

Twenty-seventh Page.—Metals. Foreign Trade
Movements. Imports. Exports. Coal. Old Metals.
Paper Stock, &c. Philadelphia (Con-
cluded). Chicago. Chattanooga. Louisville. St. Louis.
Baltimore. Richmond. New Orleans. Our Eng-
lish Letter.

Twenty-ninth Page.—Our English Letter
(Continued). Foreign. Artificial Fuel. The Per-
not Open Hearth Furnaces at the Cambria Iron
and Steel Works.

Thirty-first Page.—The Swedish Iron Mar-
ket. The Iron and Metal Exchange.

Thirty-third Page.—The Iron Age Direc-
tory.

Thirty-fifth Page.—New York Wholesale
Prices (Continued).

Thirty-seventh Page.—New York Wholesale
Prices (Continued).

Forty-first Page.—Philadelphia and Pitts-
burgh Hardware and Metal Prices.

Forty-second Page.—Boston Hardware and
Metal Prices.

Hon. Robert B. Roosevelt on Tuesday re-
signed as Brooklyn Bridge Trustee, alleging
his inability to penetrate the mysteries of its
management. His principal reason, given in
a letter addressed to Mayor Grace, is that the
bridge will probably not be finished for two
years, on account of the delay in furnishing the
steel, thereby placing the trustees in an un-
comfortable position. It is time that official
inquiries were instituted, in order to fix the
responsibility for alleged mismanagement
wherever it belongs, and to apply a cor-
rective.

The Labor Situation West.

There have been some important happen-
ings in the iron strike in the West since
those mentioned in our last issue. In the
first place, however, it may be well to say
that at this writing not an iron mill west of
the Alleghenies has signed the scale which
did not sign it the first day. Seven mills
have signed, as before reported. The fact
that two of these had signed was not known
until some days after the strike began, but
they all signed on or before the 1st of June.
Since then there has not been a break in the
ranks of the manufacturers. On the other
hand, in addition to those mills that were
running on the 1st, in spite of the Amalgam-
ated rules breaks have been made in their
ranks. The Superior Mill of A. Klonan, at
Pittsburgh, has started up in some of its
departments against the rules of the Union,
and the Apollo Works of Laufman & Co.,
near Pittsburgh, were to start Wednesday
morning of this week. This last is very sig-
nificant. Mr. Laufman has in the past been
especially friendly to the Amalgamated, and
his action in defying it will have a decided
influence in convincing its members that the
manufacturers are in earnest and determined
not to yield.

Another important factor in the situation
was the action of the manufacturers at their
meeting of the 7th, resulting in the forma-
tion of an organization. Of equal signifi-
cance is their action in reaffirming by unani-
mous vote the action of the meeting of May
25, in refusing to pay any advance on the
wages scales in force prior to June 1. It
has been widely reported that the vote was
not unanimous, but we have the best author-
ity for our statement that there was not a
vote against it, and the meeting was the
largest ever held in the West.

Another feature is the backdown of the
recalcitrants at Cincinnati, and the return to
work last Monday. As we have explained,
after the strike last year the Cincinnati iron-
workers agreed to continue at work after
June 1 at old prices, unless a scale was
agreed upon at Pittsburgh, when this scale
was to be the one paid. The workmen
refused to be bound by the agreement. Mr.
Jarrett, however, went to Cincinnati and
prevailed upon the men to resume work. It
may be stated that this action of the Cincin-
nati mills, so far as the manufacturers are
concerned, is taken with the full knowledge
and approval of the other Western manu-
facturers.

Economy of Fuel in Iron and Steel Manufacture.

The economy of fuel in the manufacture
of iron and steel has always been a subject
of vital importance to ironmasters, although,
so far as the general public is concerned, it
appears that very little interest has been
taken in the question of how far the avail-
able supplies of coal were being reduced, and
to what extent they were wasted or econo-
mized. It is a well-known fact that enormous
expenditures of fuel occurred under the
old conditions of smelting pig iron, the
records showing that the consumption in
some cases rose as high as 9 tons and more
per ton of iron produced. Within the past
50 years, however, all this has been changed,
with immense advantage to all concerned.
This reduced consumption of fuel may be
ascribed to a combination of circumstances,
such as increased temperature of the blast,
the adoption of larger furnaces, and the
utilization of the waste heat of the furnaces.
Another circumstance directly affecting this
economy has been the increasing use of hem-
atite ores, suited to the production of Besse-
mer pig, inducing economy not alone in
the blast furnace, but also in the preliminary
operation of calcining. The introduction of
fire-brick stoves has also largely contributed
to economy of fuel in the blast furnace,
varying, in many cases, from 10 to 20 per
cent. In furnaces using raw coal, the econ-
omy runs sometimes from 7 to 8 cwt. per ton
of pig. A comparison of the average con-
sumption of fuel per ton of iron smelted in
Great Britain and in the United States points
to a greater economy in our country, and is
ascribed mainly to two causes: The greater
richness of the ores employed, and the ex-
tensive use of anthracite, which, for smelt-
ing purposes, is almost equal to a similar
weight of coke. The following details of
the working of anthracite blast furnaces in
the summer of 1881 are given on the author-
ity of Messrs. Taws & Hartman, of Phila-
delphia:

Furnaces.	Coal used per Ton of Pig.	Ore Charged per Ton of Pig.	Height of Furnace.	Bosh.	Heat of Blast.	Average weekly make of Pig.
1.	Lbs. 2,987	Lbs. 4,480	Feet. 70	18	Deg. 1,100	Tons. 470
2.	2,820	4,219	70	16	1,348	292
3.	2,603	3,901	56	15	870	403
4.	2,577	4,212	75	20	765	527
5.	2,618	4,359	66	17	750	390

It will be seen from this that the minimum
consumption was 1.1 tons of anthracite per
ton of pig iron, and the maximum 1.3 tons.

In the manufacture of charcoal iron the
fuel economy noted in connection with min-
eral fuel has not been witnessed, although
some progress has been made in this direc-
tion. The charcoal iron industry appears to
be mainly centered in this country, where from

450,000 to 500,000 tons of pig are made
annually from vegetable fuel, the total an-
nual production of Europe probably not
exceeding 350,000 tons. The exact produc-
tion of American charcoal pig iron in the
census year 1880 was 435,018 tons, and the
quantity of charcoal used in its manufacture
was 53,909,828 bushels = 493,000 tons of
charcoal, giving an average consumption of
1.14 tons of charcoal per ton of pig. The
consumption is, however, very often consid-
erably within this limit, as shown by the fol-
lowing examples:

Deer Lake Furnace	1.073
Mo. gan	0.853
Ray	0.85
Fayette	1.040
Elk Rapids	0.884

In a statement of the results of the work-
ing of 11 charcoal blast furnaces in 1881,
contributed by Mr. John Birkinbine to the
Census Report of the United States for the
preceding year, it appears that the consump-
tion varied from 1691 pounds to 2631 pounds
of charcoal per gross ton of pig iron—a vari-
ation of 940 pounds, or about 9 hundred
weight. In Sweden the consumption of
charcoal per ton of iron is stated to be about
16 1/4 hundredweight, which, therefore, is
considerably under the average consumption
in our country. In 1880 the total consump-
tion of charcoal in all departments of the
iron trade of America reached 69,592,000
bushels, which, allowing 22 pounds to the
bushel, is 683,500 tons, and is equal to the
produce of more than 50,000 acres of wood-
land. Notwithstanding the extent of our
forests, it is not at all unlikely that this drain
upon their resources will ultimately result in
complete exhaustion, indications of which
are already observable in such districts as
have hitherto been most favorably situated
for carrying on the manufacture.

The actual production of pig iron and coal
in the principal iron-making countries is set
forth in the appended table, which, on the
basis of 2 tons 3 hundredweight of coal per
ton of pig iron, shows the percentage of the
total output of coal used in the iron produc-
tion of each country:

Country.	Tons.	Quantity of Coal Raised.	Quantity of Coal used in making Pig Iron at 2 Tons 3 Cwt.	Percentage of Total Coal used in Pig Iron Manufacture.
Great Britain	8,377,364	13,118,400	18,011,328	11
The United States	4,414,676	70,000,000	9,079,503	14
Germany	2,958,812	45,000,000	6,413,133	14
France	1,894,434	19,000,000	4,074,117	21
Belgium	615,000	16,880,000	1,323,250	7
Russia	450,000	29,950,000	967,500	3
Austria-Hungary	450,000	5,317,604	1,039,000	19

It is not alone in the production of pig
iron, however, that the question of econo-
my in fuel is important. The various other pro-
cesses, such as puddling, the production of
Bessemer, open-hearth and crucible steel,
foundry castings, tin plates, and forgings,
all consume large quantities of fuel, which,
though not to be compared to the quantities
consumed by blast furnaces, are still worthy
of consideration. This becomes readily ap-
parent by an inspection of the following
table, presented to the British Iron and Steel
Institute in a paper by Mr. J. S. Jeans:

CONSUMPTION OF COAL IN THE MANUFACTURE, ETC., OF IRON AND STEEL IN 1881.	Tons.
In the manufacture of pig iron	18,011,328
In the manufacture of finished iron	8,043,000
In the manufacture of Bessemer steel	906,000
In the manufacture of open-hearth steel	676,000
In the manufacture of crucible steel	120,000
In the manufacture of foundry castings	200,000
In the manufacture of tin plates	577,000
In the manufacture of forgings	455,000
In the treatment of plates, &c., for ship- building	506,000
Used in the manufacture of tires, axles, rivets, bolts, armor plates, wire and other articles	4,200,000
In the manufacture of boilers, engines and machinery	1,000,000
Total	34,674,000

This figure represents 22 per cent. of the
whole quantity of coal raised in Great Britain
in 1881. The Royal Coal Commissioners of
1869 calculated that the total quantity of
coal used in the manufacture of iron in that
year was 32,207,000 tons, which was 30 per
cent of the total quantity raised. Assuming
the accuracy of these figures, it is clear
that the British iron trade takes 8 per cent.
less of the coal output now than it did a few
years ago, and that the recent astonishing
progress of the coal industry has not been
affected by the decreased demands of the iron
trade to anything like the extent that it
would have been even in 1869.

If the consumption of coal had advanced
at an equal pace with the production of iron
since 1870, the total quantity used last year
in Great Britain, instead of being 34,674,000
tons, would have been 48,237,000, and the
main items of this difference may be thus
stated:

Tons of coal.	Tons of coal.
Saved in the manufacture of pig iron	7,121,000
Saved by the substitution of Bessemer steel for manufactured iron	4,325,000
Saved by the substitution of open- hearth steel for manufactured iron	338,000
Saved by the use of regenerative fur- naces in the manufacture of crucible steel	10,000
Total	11,899,000

The improvement of appliances for the
utilization of the waste gases from blast and
puddling furnaces will undoubtedly yield
still more economical results.

Tin Plates and Brands.

During the past three or four years those
favoring reform in the tin plate trade have
waged a vigorous and, to a great extent, suc-
cessful crusade against the iniquities which
have been perpetrated under the cover of
private brands. The business in private
brands has been practically destroyed, and
dealers who value their reputations are
repudiating everything but makers' brands,
or specialties which they guarantee and on
the quality of which they stake their reputa-
tion. In most cases these special tins and
ternes can be, and are, imported by other
houses under the names by which they are
well known to the trade; but for this the
consumer, even if he knows it, cares very
little. It may be a fact that the "Eastlake"
bright plates, in which he feels confidence,
and which come to him carefully packed,
and with each sheet separately wrapped in
tissue paper, can be bought for a dollar less
per box of any importer under the name of
"Ebbwfwfgr," or some other unpronounce-
able Welsh maker's brand. The cautious
consumer, who has been deceived a great
many times in one way or another, is not
disposed to venture the experiment for the
sake of saving the difference. He knows
that "Eastlake" is a good plate, and the
assurance that he is getting what he pays
for is of more value to him than a saving in
price would be if attended with the risk of
disappointment. Technically, "Eastlake"
may be a private brand, but it is not the
kind of a private brand which it is to the
interest of the consumer to discourage. A
system of private brands, or private grad-
ings, which are furnished with the guaran-
tees of reputable dealers, may, after all, be
the solution of the whole question.

Makers' brands are now the fashion, and
these, with the kind of private brands we
have just described, dealers are offering con-
sumers, with many assurances that all the
tricks of the trade ended when private
brands were abandoned. These assurances,
however, are not quite warranted by the
facts of the case. The private brand was an
expedient resorted to by the dealer in tin
plates to deceive the consumer in any one of
a dozen ways. Makers' brands are supposed
to afford the buyer a guaranty of quality
which is presumably good, but it is not ex-
ceeding the bounds of truth to say that they
afford no such guaranty, and that very few
of the tins which come to this country under
makers' brands can safely be purchased on
their names alone. Every importer can tell
of large shipments of very poor plates under
makers' brands which have a traditional
reputation for excellence. The maker occa-
sionally strikes a bad lot of iron, and rather
than stand the loss involved, he will float
inferior plates upon the trade, knowing that
their brands will carry them through. The
maker's brand is very likely to mean one
thing to-day and another thing to-morrow,
and in proportion as it is trusted it will be
used by unprincipled people to deceive the
consumer. We know of one grade of tin
made by one maker which is imported into
this country under five different brands,
and sold at five different prices. It is a
matter of general report, substantiated by
the admissions of makers, that the designa-
tion "charcoal" is fraudulent, and every
consumer knows that the terms "charcoal"
and "coke" are no longer accurate classifi-
cations, if, indeed, they ever were. This is
also true of most of the marks put on boxes
by makers. "Best charcoal" may mean an
inferior grade of coke iron badly tinned, and
it is very much more likely to mean this
than to mean what the words would seem to
indicate. As between the private brand and
the maker's brand, the chances of honesty
are altogether in favor of the latter; but
considering the great number of makers'
brands concerning which consumers know
little or nothing, and also considering the
facility with which their number can be in-
creased in case of necessity, it must be ad-
mitted that the maker's brand does not give
the consumer any assurance of honest qual-
ity and honest price. In looking at the ques-
tion of reform in the tin-plate trade from the
consumers' standpoint, *The Metal Worker*
says:

There is but one remedy—consumers must dis-
card brands altogether and buy tin plates accord-
ing to specification. The brand will then become
a designation of interest only to the importer and
dealer. The consumer will neither know nor care
what the plates he buys are called in England or
Wales, nor for that matter, what the dealer calls
them. The logical and only practicable solution
of the matter from the standpoint of the con-
sumer is either to buy the kind of plates he wants,
or, if limited in price by the terms of a close con-
tract or by the conditions of business competition,
to call for samples of the best plates he can buy
at the price he can afford to pay, test the samples
and select the best. If, for example, he wants a
plate for stamping, or for the manufacture of
pieces of ware, or for a first-class job of roofing, his
experience will enable him to prescribe the condi-
tions requisite, which can best be expressed in a
simple physical test of quality. Where tin is to be
used for a given purpose, it makes no difference
to the consumer whether it is called charcoal or
coke. If he wants to double-seam it, the plates
must be sufficiently tough and ductile to double-
seam. If he wants a well-coated plate which will
draw down in a press or fold under the mallet
without cracking, he can best secure it by calling
upon respectable dealers for samples of plates
which will conform to certain tests, making the
tests himself, selecting the plate which suits him
best and holding the dealer to delivery according
to sample. It makes no difference to him whether
the plates reach him under one brand, or six, or
none. All he need care about is that he gets
what he buys, and this he is likely to do if the
dealer is given to understand that any plates not
up to sample will be returned, and that he will
have the consumer's trade only so long as he deals
fairly and honestly with him.

This suggestion is a good one, and we
commend it to the consideration of dealers
as well as consumers. We believe that there
are in the trade a good many who honestly
desire to see it thoroughly reformed, and
who know that at the present time it is ro-
tten throughout. A reform on the basis sug-
gested by *The Metal Worker* is entirely prac-
ticable and in all respects desirable, and we
fail to see why it is not good policy on the
part of leading tin plate houses to anticipate
such a demand from consumers, and offer
them classified plates, graded without refer-
ence to name or make, but in strict accord-
ance with quality and value. This would
leave very much less chance than now
exists to swindle the consumer by making
him believe that a plate of which he knows
nothing is "equal" to one in which he feels
confidence, and somewhat cheaper; but the
leading houses in the trade are not after
this kind of profit, and it is to their
interest to discourage and drive out of the
business those who are. Under such a sys-
tem plates would be sold for just what they
are, and there would be a constant induce-
ment to improve rather than to lower the
standards of quality. Manufacturers would
be held to much closer account by importers
than now, and dealers would have a chance
to establish reputations for accurate and
honest classifications which would go far to
win the confidence of consumers. In a
word, the new system, if it can be estab-
lished, will wipe out nearly all the tricks of
the trade which have brought it into so
much disrepute, and as this is what many in
the trade are honestly seeking, we trust
some house will find it to its interest to
venture the experiment.

Opening Corea and Anam.

Stirring events are promised in Eastern Asia
in territories contiguous to the Chinese Em-
pire. Indeed, the French have already com-
menced a new page of history by landing a
force in the Empire of Anam, which adjoins
China on the Southeast, and capturing Ha-
Noi, the capital city of one of the provinces.
The dispatch says, in reference to this
achievement, "the ultimate object is ob-
scure." The population of Anam or Coch-
China is estimated at 12,000,000 or 15,000,-
000, and the army is said to number 60,000.
The territory comprises three distinct sec-
tions, including Tonquin and Cambodia, and
has several safe and commodious harbors.
As we have had several fragments of infor-
mation of late respecting French operations
in Tonquin, we may safely assume that
French diplomacy and French ambition are
having full play in that remote part of the
globe, and before long will be seen to possess
more than ordinary significance. The com-
modious harbors, doubtless, have a special
attraction, and the "ultimate object" may
cover deep schemes for commercial advance-
ment. The provincial governors near Ha-
Noi, it is stated, "already show signs of
submitting to the (new) ruler of Anam,"
from which we may infer that the subjugation
of Cochinchina is virtually accomplished, and
without exciting more preliminary observa-
tion in Western Europe than did the brilliant
coup in Tripoli.

Next in order among movements in the
far East is a contemplated advance on Corea,
which, likewise, promises to be sharp and
decisive, and may lead to serious entangle-
ments. A recent telegram from Hong
Kong says: "After a long and secret prepa-
ration the details of Commodore Shufeldt's
expedition to Corea are now disclosed."
Instead of accepting aid from Japan he
relies chiefly on Chinese influences. This
"enables the representatives of all other
western nations to proceed simultaneously
with him, or possibly to anticipate him,"
whereas, if Japanese co-operation had been
adopted, America would have been forced
"into the field. Everything is now to be
done under the theory that China controls
the foreign affairs of Corea." We have
here, apparently, the approaching culmina-
tion of a plot in which several of the lead-
ing powers of Europe have been long intrigu-
ing. Russia, it is well known, has looked
covetously upon certain splendid harbors in
Corea, invaluable for the maintenance and
extension of her naval prestige. Other powers
have been no less anxious to break in upon
the seclusion of the Coreans, who, thus far,
have resisted successfully every attempt at
invasion. Moreover, the Japanese claimed
to enjoy certain rights and prerogatives in
common with China, these two countries
having thus far held between them and
engrossed the trifling amount of Korean com-
merce in which this marvellously self-con-
tained people have seen fit to indulge. Very
plainly, the Japanese have been badly
outgeneraled in the matter, with consequences
beyond present calculation.

As might be expected, there is a flutter
among the naval squadrons of England,
France and Russia, all of whom have vessels
hastening to the scene. The fact that Com-
modore Shufeldt, in the steamer Swatara,
accompanies the Chinese squadron bearing
the Korean envoys from Peking, will be sure
to arouse earnest attention in the United
States. Are the scenes attending Com-
modore Perry's landing in Japan to be repeated
in another field? The Coreans are described
as physically a noble people, and their coun-
try possesses considerable resources in pre-
cious metals and products of agriculture, but
the commercial results of breaking down the
walls of Corea and Anam, however impor-
tant, can scarcely compare with those of
another character affecting the relations of
governments one to another.

The Employers' Liability Act in Great Britain.

Judging from the numerous statements now advanced in Great Britain, it appears that the employers' liability act may be safely classed among the many irritating and annoying acts of Parliament so objectionable to large employers of labor. The act was undoubtedly passed mainly in the interest of the workingman, and though its aim is unquestionably one deserving encouragement and praise, it becomes readily apparent that penalties for injuries are sometimes imposed, notwithstanding the fact that the latter may have resulted directly from gross carelessness of the injured and against which no precautions could guard. The act is, therefore, evidently defective in an important point, and, in order to remove the difficulties of its practical working, measures were adopted by employers to protect each other's interests. Some of the employers of labor, as the London and North Western Railway Company, the Great Eastern Railway Company, and others, impose upon all their men "conditions of employment," the object being to make the heavy pecuniary compensation clauses of the Act inoperative. A mutual insurance fund was established to which employer and employee contribute in certain fixed proportions, and it is out of this fund, and not through the claim which the act empowers the men to make, that compensation is to be made. Although general satisfaction is expressed on both sides, so far as this step was concerned, the question has been raised whether it is permissible to set aside an Act of Parliament by a contract of the kind mentioned, and it is not improbable that considerable discussion will arise before this point is definitely disposed of. Vexatious cases, in direct connection with this subject, are of frequent occurrence in British courts, and from past experiences it appears that employers often decline practical sympathy with sufferers in their employ when threatened by legal proceedings.

The correct interpretation of the principal clauses of the act also forms a subject demanding immediate and careful attention, cases often arising in which lawyers and judges of County Courts cannot arrive at a definite understanding. Such difficulties consequently foreshadow early changes, and it is feared that any imprudent steps in either direction will entail disastrous consequences. The act, in its present condition, cannot, however, be regarded as an effective means of solving the questions now of almost daily occurrence, and it is hoped that the great importance of the subject, as affecting the manufacturing and mining industries of Great Britain, will greatly contribute to a successful and satisfactory issue of the controversy.

Expansion in Canada.

Schemes of whatever kind originating in the Dominion are nothing if not magnificent. This is true especially of railroads, canals, and other works of internal improvement. Another phase of this very laudable ambition to excel is seen in the measures taken for the development of Manitoba, by building railway lines and inviting immigration, accompanied with much loud trumpeting and extraordinary inducements in the shape of free passages and grants of land. It was not long ago, if we rightly recollect, that a Manitoba hen was discovered to have laid an egg with a gold coin inside of the shell. Some of the freshest among the new arrivals did not quite swallow the story, whatever may have been thought of the wonderful powers of deglutition displayed by the fowl. A subject for more thoughtful consideration is found in the unprecedented expansion of loans, or extension of credits, on the part of banking institutions situated within the Dominion. At the annual meeting of the Bank of Montreal, held June 6th, Mr. Chas. F. Smithers in the chair, the president took occasion to remark that the total of loans and discounts during the last six months was beyond precedent, and that the profits of the institution had been correspondingly good—equal to an improvement of about 1½ per cent. compared with last year, when the net profits were \$400,000 in excess of the previous year. Doubtless no small share of these earnings was realized from loans in Wall Street, but the local demands for capital have been, at the same time, very pressing. President Smithers evidently thinks it might be prudent now to take in sail. He says:

But the increase of business noted is not by any means confined to this bank; it is general, if not universal, and embraces all the items of discounts, deposits, circulation, &c. The total loans and discounts of all classes upon the 30th April show an increase over the same day in 1881 of \$16,000,000—amounting in all to the enormous sum of \$175,000,000, a sum which I am quite safe in saying they never reached before. In 1875 they touched \$160,000,000, which was thought to be, and doubtless was at that time, a very dangerous expansion; the result proved it, for the banks did not get back to safe limits without passing through a very severe ordeal, which overwhelmed some of them, seriously crippled others, and damaged all to a greater or less degree; and in calling attention to the much larger figures which have now been reached, I do not wish to be considered an alarmist; but, to say the least, the figures are somewhat startling. I am quite sensible that the conditions of the country have greatly changed, and we can perhaps carry a heavier load now; still it is the part of wisdom to look the matter squarely in the face. I do not say that I see trouble in the immediate future, but it is well that we should be on the look-out and be prepared if it does come. It is quite certain that we—that is the banks generally—cannot go on expanding at this rate much longer, and the sooner we understand that the better.

The chairman proceeded to say that it was an undeniable fact that trade was not in an altogether satisfactory condition, on account of light profits, stocks of merchandise remaining unsold, and a possibility that manufactures are being overdone. Then there is the large falling off in the exports in the face of increasing imports. He also intimated that railroad building may be in advance of the necessities of population, and waiting for the country to grow is a tedious and painful process. These suggestions, coming from a leading financier in the Dominion, are worth heeding, for, to a certain extent, they apply to the country at large, irrespective of boundary lines. In the remarks above quoted the speaker finds relief in the great Northwest, which he says is "the hope of Canada." It is as producers that the new territories must exercise a most important influence on the future. Thence Canada must derive, in large measure, materials wherewith to correct the trade balance. At the same time manufactures must be sedulously fostered, particularly in the export departments, and gradual lowering of prices will not be without good results in the latter respect.

The country is to be congratulated on the appointment by President Arthur of a Tariff Commission consisting of men presumably competent to grapple with the task committed to them. The selections made for this purpose are eminently judicious. In the main the appointees are not only in accord with the spirit of the present Administration, which is all-important as affording a guarantee against disturbing, or at least factious, influences, but they are men of a practical business character, familiar with economic questions affecting the interests of the country and fully alive to the requirements of the situation. There is reason to be wary of the advice so freely tendered, in some instances, by persons inimical to the present system of revenue. Merchants and manufacturers are not prepared for radical measures of whatever kind, however sincere or worthy the motives of those by whom they are urged. There has been shown among all classes considerable unanimity in regard to needed modifications of the tariff upon certain raw materials, but even these call for the exercise of a careful circumspection. The President evidently appreciates the delicacy, not to say dangers, of the work upon which the commission are about to enter. It is only to be regretted that any doubt could have existed as to the acceptance of proposed members of this body when they were apprised of their nomination.

An article is going the rounds of the daily press with the very taking title of "Coal by Wire." It is an outgrowth of speculation upon the possibilities of the dynamo of the future. The gist of the article is this: That by utilizing the immense water powers of various parts of the globe in driving dynamos, the power may be sent as electricity over comparatively small copper conductors to any point where it is desired to use it. This, of course, will do away with the necessity for the transportation of coal. It would also be possible to utilize the coal at the mines in driving engines, and then transmit their power to great distances, the profit, in that case, coming from cheap coal and the saving in its transportation. The possibilities of new combinations which the dynamo presents are so great, and our knowledge of its limitations so comparatively small, that the imagination is prone to run riot. At present we must wait for improved forms of dynamos, for there is too great a percentage of loss to allow us to introduce them into any and every situation where transmission of power may be desirable.

It appears highly probable that the basic process will soon be extensively adopted in the North of England, in order to permit a successful utilization of Cleveland ores for the production of steel. These ores have not within the past few years been in great demand, on account of the large importations of Spanish ores, and it is expected that the basic process will re-establish their popularity and increase the demand for them.

The National Exhibition at Turin.

It is stated that an influential general committee has been formed for holding a purely national exhibition at Turin, in the summer of 1884, as a complement to that of Milan last year. A site has been chosen and the buildings are to cover double the area of the Milan exhibition. The idea is rapidly progressing, and the shares of the guarantee fund are reported to be taken up well. An appeal to co-operate is made to industrial and scientific institutions, and local committees are to be formed throughout the country for serving as connecting links between the management and the exhibitors, and for interesting the population in the undertaking. They will, moreover, decide upon the quantity of proposed exhibits, assist producers in preparing and forwarding them, and ascertain whether the articles sent are really Italian productions. Another, and important office of the local committees, will be to obtain and impart information as to improved processes of manufacture, and as to foreign markets for produce. All natural products will be admitted, with a few obvious exceptions, a limit being put upon the quantities of stone, ores, metals, &c. The Art Commission make an appeal to Italian artists to contribute to the Fine Arts Exhibition that will be held in connection with a collection of ancient works of art. Consuls in other countries are also urged to interest foreigners in the Exhibition, and induce them to visit it. It will be seen, therefore, that ample measures have been taken to secure interesting exhibits, and there seems to be no reason why the undertaking should not be crowned with success.

The "House of Lords" and the "House of Commons."

The following letter has been sent for publication. It is in the main correct as to its statement of facts, but as it is obviously a strongly *ex parte* statement, it makes the facts appear in a somewhat different light from that in which the gentlemen interested in organizing the "House of Lords" see them. If it should call out any statements as to why the membership of the "House of Commons" was discriminated against in the original plan, we shall print them with the same freedom that we do this:

NEW YORK, May 31, 1882.

To the Editor of *The Iron Age*.—DEAR SIR: Your valuable journal, with a proper regard to the interest taken by the trade in the subject, has carefully followed the two Exchanges through their successive developments. The various articles have, however, been necessarily disjointed, and now that one Exchange has already opened its rooms, and the other will do so in a short time, it may be of interest to your readers to give a connected *resumé* of the history of both, even though the statement is frankly an *ex parte* one.

The question of establishing an Exchange for iron and metals in New York had been discussed for years past, but with more earnestness since the beginning of 1881, and about the middle of January, 1882, the members of two brokerage firms came to the conclusion that the time had arrived for some definite action. After consultation as to the best way of going about it, they drew up a call for a general meeting of the trade, and secured the signatures of 20 prominent firms, all except one of these 20 being asked for and obtained directly by the two firms above alluded to.

The meeting took place at Delmonico's on February 15, and as—the object having been simply to get all who might be interested together—no attempt was made by the originators to "run" it, it was called to order, and the organization captured by a gentleman who, until that moment, was not known to take any interest in the matter, and who 15 minutes before had expressed a doubt as to being present at all. After a general discussion the chair was directed to appoint a committee of nine, who were to report in two weeks as to the advisability of establishing an Exchange and the best manner of so doing. The meeting then adopted a resolution that an Exchange, in its opinion, was desirable and practicable, and was about to adjourn to receive a report from the committee in two weeks, when the same gentleman who had called the meeting to order suggested the committee might not be quite ready within that time, and that it would be better to adjourn subject to call of the chair. The suggestion was adopted and the meeting adjourned, never to be called together again, either by chair or committee. This was on Wednesday, and on the next Monday the *Journal of Commerce* announced the names of the firms selected as members of the committee. Not only were the original movers entirely ignored, but not a single broker appeared on the list, and some of the firms named had publicly expressed their disapproval of the whole movement.

Two weeks passed with no notification of any action on the part of the committee, or report of their progress, when a circular was issued by them—which one member refused to sign, on the ground that they had no right to take such action—announcing that the signers, "appointed as a committee," were about to organize the "New York Iron and Metal Exchange," and asking the recipient to send in his name if he wished to become a member. This circular was distributed privately, apparently only to personal friends of the committeemen, but leaving out all brokers and any dealers or importers who were occasionally in the habit of doing business as brokers. It was the first intimation that the committee intended to exceed the powers granted them by the body to which they owed their existence, but was succeeded shortly by rumors that they were taking steps to incorporate themselves as a stock company, in which they and the friends on whom they could rely should have exclusive control, should admit or reject whom they pleased, and should dictate to the entire iron and metal trades of the country the manner in which the business should be done. At the expiration of another week, restive under the continued silence and inactivity of the committee as far as the public was concerned, nine firms addressed a joint letter to the chairman, requesting that another general meeting should be at once called. He replied, saying that the committee had not yet "matured their plans," but would doubtless have a report ready in "about 10 days." A second letter was addressed to him, making a more peremptory demand that the meeting should be called "to hear progress," to which the same reply was made as to the other. This was six weeks from the 15th of February, and while these letters were passing—on March 21st—the nine members of the committee had applied secretly to the office of the Secretary of the State for a certificate of incorporation—not a charter—under the General Business Act of New York State, with the curious title of the Iron and Metal Exchange Co., Limited. Had this action been first reported to the trade as a proposition for their approval, it would have been only a mistake, since the act does not contemplate exchanges, and makes no provision for their proper organization; but taken as it was, it was a bit of bad faith, committed by nine prominent and reputable gentlemen, in whose hands a public trust had been reposed.

Having completed this organization by choosing shareholders from among those on whose support they could depend, and partitioning out a beggarly capital of \$3125 among them, they announced to the public that they were to receive associates at a due of \$75 per annum, for which they could have use of the company's rooms, but no voice in the management of its affairs, while the report flew rapidly that, in the selection of these associates, some persons who had happened to make themselves obnoxious to the directors were to be entirely excluded, and the whole brokerage interest was to be carefully sifted. Then came the Declaration of

Independence by those who did not believe that an exchange should be run on the same plan as an iron furnace or an ore company, and that the members of the iron and metal trade of New York City were quite capable to manage their own affairs, without the supervision of a handful of self-appointed dictators. A paper was at once put in circulation, binding the subscribers to it to pay \$100 for their seats in an exchange (with an annual due of \$25), the organization and control of which should be in the hands of all the members, the outcome of which has been the "House of Commons," an institution that bids fair to overshadow the "House of Lords," and establish itself as the popular branch, as its name indicates. It was a week or two before it was thought advisable to name a date for organization, but finally, on the 19th of April, it was decided to elect the officers on May 3d, "provided 100 members have then subscribed." Before May 3d over 200 had subscribed, and the New York Iron and Metal Exchange was an assured success. The process was a simple one, and no effort was made to exclude any one or to secure the benefits for a little clique of men. Everything has been done in open day, and the consequence is that as it has not distrusted others, it has obtained confidence for itself. Both houses stand ready now for the test of time and experience. The Lords have made various concessions, in view of the success of their rivals, first announcing that they would not exclude anybody, then that they would increase their stock for the benefit of the associates, and finally that they would give the associates a voice in the management of affairs. They still remain, however, a body in which not more than one-half the associates have any legal share in the property or profits, or any legal right to vote for officers or rules. They may be accorded such a privilege by courtesy of the shareholders, but at any time the latter so please they can resume all their power and relegate their less fortunate fellows to the position of lessees under dictation. They have taken a handsome room on Wall Street, some distance from where the bulk of the business is done, and there the members have daily chats, for as they profess to have a holy horror of speculation, nothing that would look like the ordinary business of an Exchange is allowed, or even possible, under their rules. The company is controlled by two elements, those who wish to dominate and those who say frankly that they don't want any Exchange, and that theirs is an experiment for one year only. The Commons have started to be a permanency, and to this end have established a surplus fund of \$20,000 as a sort of nest-egg that makes each member's seat a valuable investment, with something always behind it that guarantees him against loss in any event. They have adopted, with a few slight alterations, the rules of the Produce Exchange, the most successful Exchange of its age in the world. Their building, which they will occupy as soon as the bank from which they have leased it moves out, is in the heart of the trade, and, when they move into it, they go with the intention not of making an experiment, but of building up a lasting institution. If from any cause they should ever wind up, there will be no question as to whom the surplus fund shall belong, for there are no shareholders with a legal right to any profit there may be. In this, as in all else, each member stands on an equal basis, not nominally and by a temporary courtesy, but actually and by right. What will be the outcome time only can tell, but the history of Exchanges is that every one founded on the basis of the House of Lords has failed, and every organization in a large trade, like that of the Commons, has been useful and a success. It is a matter for regret that the division should have taken place, but the Commons were obliged to carry out their plan in self-defense. Otherwise, the Lords would have assuredly failed in carrying out their plan, and so have prevented for all time the formation of an Exchange in New York. Perhaps it will not be long before we abolish this abnormal nobility, and each of the nine committeemen, even, will be glad to say that he is

A COMMONER.

OBITUARY.

ERASTUS W. SMITH.

Another addition has been made to the steadily increasing list of deceased members of the engineering profession, and it is with profound sympathy that we record the death of Mr. Erastus W. Smith, which occurred on Monday afternoon at his home, 42 Dominick Street. He was somewhat over 60 years of age, and his death resulted from a complication of diseases which had for six months past prostrated him. Mr. Smith was a native of Mansfield, Conn., and after having worked as a carpenter and millwright in Ohio for some time, he came to New York and apprenticed himself to the late J. P. Allaire, proprietor of the Allaire Iron Works. After but a brief stay at this place, he applied himself to the study of mechanics and physics in the University of New York, graduating in 1834. In the capacity of consulting engineer he had been connected with the Ocean Steam Navigation Company, the Collins line of steamships, the New York and Havre Steamship Company, the New York, New Orleans and Havana Steamship Line, the Norwich and New York Transportation Company, and the North American Steamship Company. Many of the finest engines built in this country are from his designs and drawings, notably those of the Metropolitan, Bristol and Providence of the Fall River Line and others. Mr. Smith was also prominent in the field of civil engineering. He was consulting engineer to the Board of Public Works of Chicago during the construction of the famous tunnel water works of that city. He designed and constructed the water works of the city of New Orleans, and was also connected with the construction of the water works of Cleveland, Ohio. He was engineer-in-chief of the Harlem Bridge at the head of Third Avenue, and at the time of his death was a trustee of the Brooklyn Bridge. Mr. Smith's death is deeply mourned by his numerous friends, and has created a void in the hearts of many which will not soon be filled.

WILLIAM NEILSON.

The death of Mr. William Neilson, of the Mossend Iron and Steel Works, has deprived the Scotch iron trade of one of its most noted members, one who occupied for many years a conspicuous position in bringing about the recent developments in the manufactured iron and steel trades of Scotland. Mr. Neilson belonged to a family that has been connected with the iron manufacturing and engineering industries for almost three-quarters of a century, and his uncle, J. B. Neilson, was the famous inventor of the hot blast for iron smelting. With the co-operation of his father and his two brothers, he started the Mossend Iron Works, near Glasgow, in 1840, and this establishment, though commenced on a small scale, was destined in course of time to become the largest works of the kind in that section of the country. Mr. Neilson was ever ready to adopt the most advanced notions as to rolling machinery and other plant, with the view of maintaining the high reputation which had been secured by the finished iron branded "Mossend." In that way he was one of the first iron manufacturers in Scotland to adopt reversing gearing in his rolling mills working on heavy plates and bars, and he was one of the earliest to employ the Siemens heat generative system for his reheating furnaces. It will be seen from this brief statement that Mr. Neilson, whose decease is now mourned by a large circle of relatives and friends, was in the front rank of the Scotch iron trade, and his name well deserves to be held in remembrance for many years.

The National Association of Stove Manufacturers.

CHICAGO, ILL., May 30, 1882.

DEAR SIR: The Executive Committee, to whom was referred the subject of time and place for holding the semi-annual meeting, have decided that the most convenient place for all is Niagara Falls, and date of meeting June 21. Arrangements have been made with the proprietors of the Cataract House to provide accommodation for the association at reduced price. Yours respectfully,


WILLIAM H. SARD, Secretary.

Considering the preparation which has been made to digest a scheme for this meeting, so that the whole time can be profitably filled with the discussion of subjects of immediate and vital interest to the trade, we have no doubt it will be an unusually profitable meeting. The trouble hitherto has not been that the association had nothing to do, but that, owing to the lack of a well-digested order of business prepared in advance, hour after hour has been wasted, and the really profitable discussion has been carried on in the lobbies after adjournment. We hope this mistake will be corrected this year.



NEW PUBLICATIONS.

THE KINEMATICS OF MACHINERY. Outlines of a Theory of Machines, by F. Reuleaux. Translated by Alex. B. W. Kennedy. Six hundred and eighty pages, 451 engravings. Published by Macmillan & Co. Price, \$4.50.

The first feeling of the scholar in taking up this work is one of admiration and surprise, yet upon further examination he finds that it is truly what the title suggests, merely an outline. On the other hand, the mechanical man feels a keen disappointment in the reading. The analyses which, theoretically, are so beautiful, lack practical application in a way which can hardly be defined. There is often a temptation to find fault with the ultimate result attained, and to consider as compound those elements which are judged as simple. In reducing a great variety of the mechanical motions to "chains" of links a great step has been made, and yet this does not satisfy nor always aid the practical man in his work, though a flood of light is let in upon the science of mechanics by this analysis, and by means of it the author shows that a vast multitude of very dissimilar machines have similar mechanical elements. In this the work is decidedly valuable, and the chapters devoted to it are most instructive. When, however, the reader approaches the chapter on notation and synthesis, the fact becomes very apparent that the work is vastly better suited to drill the student than to aid the constructor or inventor. The terms used in the notation are many of them familiar, but a few are singularly unfortunate—as, for example, the use of the term "full" bodies instead of solid bodies, and "open" instead of hollow. This list might be much extended. Professor Reuleaux evidently appreciated the difficulty of his task in striking out a new path in an entirely new direction. While doing good work in pointing out what was needed and some of the steps by which we must obtain it, there are gaps to be filled, some of which have been but imperfectly bridged and others left for the student to pass as best he may. This work is in marked contrast to the same author's work upon machine design, which is most satisfactory in every respect to both the theoretical and practical mechanic. In this work the author attempts to put tools into the hands of the inventor, so that mechanical synthesis may be made easy and invention scientific, instead of a matter of "inspiration." In this the failure of the system is most signal, and yet at first sight it appears to be a success. To the designer of machinery it is, as Professor Thurston has happily shown, very useful, enabling the whole machine, in a certain sense, to be planned in advance. But designing, though very like inventing, is widely separated from it. The designer gives us a new machine, composed of known elements, working in old and well-known ways; there is no element of the "novel" in it. His work is the work of synthesis. The inventor of necessity works in a different manner, and those aids which the designer uses are handled in a very different fashion. That these methods may be reduced to philosophical methods, suitable for the inventor, there is no doubt, but it will be necessary to make a keener analysis of mechanics than has yet been done in order to accomplish this. The system of notation employed contains a germ of great value, which will probably be the foundation for the system of the future. The nomenclature strikes us as faulty, but

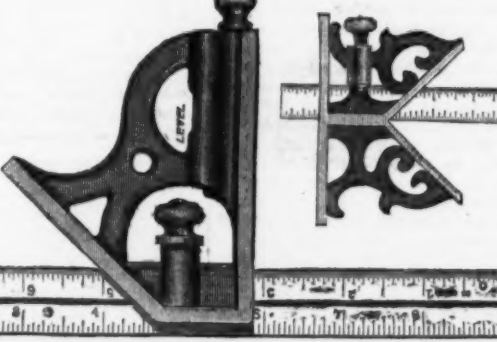


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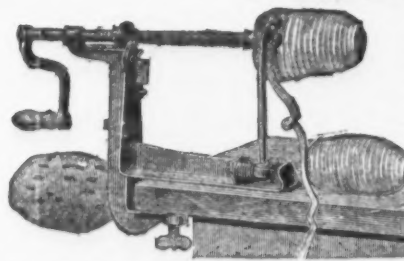
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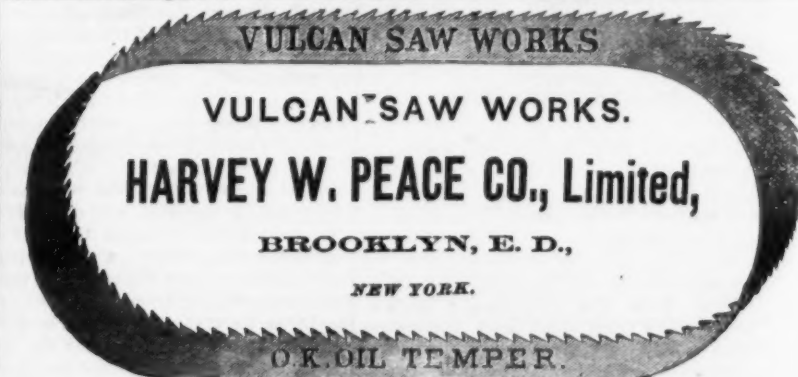
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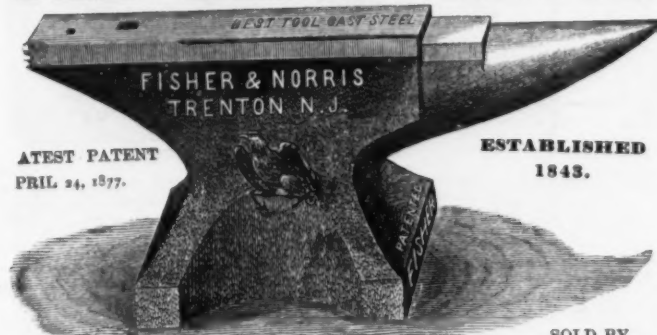
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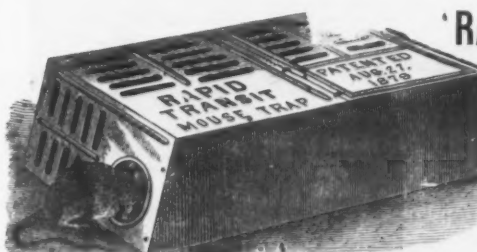
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this could hardly be otherwise in a work departing so radically from previous methods. In regard to the analysis of mechanical forms, to which we have alluded, we might speak at great length. At times it is exceedingly thorough and rigid, leaving nothing to be desired, notably in the matter of the general solution of the machine problem. At other times the analysis seems to have been stopped too soon, and the mechanism not reduced to its simplest form.

The book is finely printed; it has upward of 600 pages and contains 451 figures. Many of these figures are elaborate engravings, in that superlatively beautiful German style which, for mechanical work, leaves nothing to be desired. Though the student may not be entirely satisfied with the translation, the work as a whole will be a most useful contribution to a science which has a comparatively small literature.

WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., June 14, 1882.

The President's selection of gentlemen to constitute the Tariff Commission does not meet with the heartiest approval of the Democratic Senators, and in the consideration of the nominations that portion of the Committee on Finance interposed serious opposition. Their antagonism, however, did not amount to sufficient to cause any delay in making a report, nor did it jeopardize the interests of any of these gentlemen as far as the committee was concerned, as the weight of numbers and of votes were against them.

THE VACANCIES ON THE COMMISSION.

The declarations of ex-Vice-President Wheeler and Mr. Phelps, of Missouri, are still perplexing the President. Two gentlemen have been settled upon, but no announcement will be made until they have signified their acceptance. The Pacific Coast puts in a strong claim for recognition, and Assistant-Secretary New is making an effort to secure one of the vacant places for an Indiana man. The rush for these places, however, was so irresistible that the President found it extremely difficult to "boil down" a list of upwards of 200 applicants to nine appointees. It was the President's intention, originally, to designate Senator Eaton, of Connecticut, who, however, did not desire the place, and afterward Senator McDonald, of Indiana, but Secretary New objected to this, as coming from his State, as parties were too closely divided there to give the opposition the prestige of such recognition.

THE EIGHT HOUR LAW.

Attorney-General Brewster having decided that more legislation is necessary before the President can execute the eight hour law, passed several years ago for the benefit of workmen in the navy yards, arsenals and other establishments of the Government employing mechanical and manual labor, as a sort of indirect recognition of the general clamor upon this subject from the laboring classes, the President is beset by personal appeals of Representatives having such establishments in their districts, and Congress itself has received about a ream of petitions on the same subject from labor leagues, and other organizations of a similar character, urging action. The effort is being made to induce the President to send a special message to Congress urging the necessary legislation. It is a fact, which might be stated in this connection, that the very persons who urge these matters simply for political capital and buncombe, regard this eight hour business as a great humbug, as if Congress had the power to say what should constitute a day's labor and its value in dollars and cents. Of course, if the Government proposes to give ten hours' pay for eight hours' work it can do so, but it has no power to establish that rule for private individuals.

GOVERNMENT INFORMATION ON THE STRIKES. The information received at the Treasury Department in reference to the strikes at certain industrial centers, does not indicate that there is any disposition to resort to the desperate methods of the labor disturbances of a few years ago. The difference between capital and labor in the present instance seems to be superinduced solely by the increased cost of living. All the correspondence and other data in possession of the Government shows this, and it is claimed by the leaders of many labor organizations which have taken this step that the ruling prices of the product of all industrial establishments are such that an increase of wages could be granted without materially affecting profits. They assert that some of the simplest articles of food have gone up as high as 25 per cent. and the increase of wages asked, in most cases, does not exceed 10 per cent. Of course the Government claims no control over such matters, but as a measure of prudence it has kept fully advised as to the nature and extent of these difficulties.

SENATOR PLUMB AND THE PRINTERS' UNION.

There is a sort of side issue going on between the Senate and the Government Printing Office on the subject of trade unions, which looks as if there would be a lively time before it is disposed of. It appears that Senator Plumb, of Colorado, had a friend whom he desired appointed as a proof reader in the Government Printing Office. The Public Printer acquiesced in the request, and the appointment was made, but no sooner had it been done than the printers' union, which seems to be paramount in that immense establishment, raised a great hue and cry, and demanded the immediate removal of this non-union man. The Public Printer was disposed to yield by compromising with these men, agreeing to transfer the appointee to some post which would not offend the autocratic notions of the union, and, at the same time, would not excite the hostility of the Senator. When spoken to on the subject, however, the Senator objected to any transfer, objected to any action inspired by the dictation of a trade union, and introduced a resolution of inquiry as to whether the Government Printing Office was run by any outside organization. The result has been an open issue, which Senator Plumb says he will test. The Senators generally favor breaking up

this control, as it has on several occasions interfered with the proper administration of the office, and has established a scale of prices to suit itself and far above what their less fortunate brothers of the craft outside receive. It is claimed that a few days' delay in the operations of the printing office would break up this despotic sway. The Colorado Senator, in the forcible vernacular of his constituents, is "considerably on his ear," and refuses to be comforted until the authority of the Government has been vindicated.

THE IRON AND STEEL TEST COMMISSION.

General Campbell is still receiving a vast amount of epistolary stimulation on the subject of the Iron and Steel Test Bill, and is quite sanguine of its early consideration and passage. He repeats, however, that it would greatly facilitate his efforts if a few influential Representatives from different parts of the country were interested in the measure by letters addressed to them in the matter. Unless some special efforts are taken it will be impossible to reach the bill this session the way the business of Congress now stands.

THE LABORING CLASSES IN ENGLAND.

Prof. R. P. Porter, of the District of Columbia, one of the recently appointed Tariff Commissioners, about the time of his nomination had just returned from a visit to England, whither he had gone to look into some matters connected with the industrial problem in that country. Professor Porter's connection with the census of the United States, in charge of Wealth, Taxation and Public Indebtedness, had eminently qualified him to make a comparison between the two countries, and his observations, in studying the condition of the working classes of England, will be of immense value to the commission, as showing the effects of the industrial system and free trade upon that dependent element. Professor Porter says that, to begin with, England is but 1,000,000 acres larger than the State of Illinois; has eight times the population, and of this 12,000,000, or about one-half of the whole, live in the city of London and the four great manufacturing counties of Yorkshire, Staffordshire, Warwickshire and Lancashire. He estimates that there are upward of 1,000,000 paupers in the country, and by official report the administration of the poor laws employs 7000 paid officials, at an annual cost of \$5,000,000. He says the total cost of indoor and outdoor pauperism is no less than \$50,000,000. This alarming state of affairs is said to be due to the industrial system of the country, the existence of free trade, and the policy of holding prices below a minimum figure so as to undersell the manufactures of other countries. This reduction of price is only justified by forcing down the rates of wages, and were it not for the protection which the Government here gives to its citizens, the working classes of the United States would be no better off than those in England, and, in fact, worse, for free trade as a part of our system, would stop all manufactures and throw our own working classes out of employment or compel them to come down to the level of the workmen of England. Although Professor Porter favors the protection of American manufactures and labor on principle since his visit to England, he regards that theory as one of absolute self-preservation on the part of every working man, woman or child in the country.

Stevens Institute of Technology.—The tenth commencement of the Stevens Institute, of Hoboken, which was celebrated Tuesday evening at the Hall of the German Club, was, as in former years, an interesting and entertaining event. A large and appreciative audience had gathered, and the various parts of the programme appeared to give general satisfaction. President Morton, as usual, delivered a short address, and invited the assembled guests to pay a visit of inspection to the college building after the completion of the exercises. After the salutatory address by Mr. H. Webster, Professor Thurston, in appropriate and well-chosen words, announced the subjects of the graduating theses which are required from each student after the completion of his course of studies. After the conferring of the degrees and the valedictory address by Mr. R. Whitlock, the invitation of President Morton, above mentioned, was quite generally accepted, and the various points of interest in the Institute building examined. The following graduates received the degree of Mechanical Engineer: Pierce Butler, Kentucky; Wilmer G. Cartwright, New York; Frederic W. Cooke, New Jersey; George Gibbs, New York; W. E. Gibbs, New Jersey; Wm. Ernest H. Jobbins, New York; Vernon H. Rood, Ohio; Alfred Stern, New York; Charles W. Scribner, New Jersey; Hosea Webster, Long Island; Joseph Wetzler, New Jersey; Roger H. Whitlock, New Jersey. Graduates from other institutions who had pursued a post-graduate course and received the same degree as the above gentlemen were: Edmund P. Lord, Massachusetts; Ph. B. Sheffield Scientific School; Addison Alex. Richter, New Jersey; Ph. B. Sheffield Scientific School. The visitors separated at a late hour, well pleased with the proceedings of the evening.

"Mysterious" Boiler Explosions.—The Locomotive recently received a communication from a well-known dealer in machinery, giving a striking illustration of the usual causes of many of our so-called "mysterious" boiler explosions. The gentleman says: A gentleman applied to us for a "cheap boiler," one that "would be good for two pounds or so." The only one we had had just been tested at 150 pounds to the square inch, but that was "too good." He said he once bought one for \$30, and ordered a young man in his employ to get up steam in it. He went away and was gone longer than he expected, and on his return he found a raging fire in the furnace, a pot filled with bricks on the safety-valve lever, and a very much frightened young man hanging on to the same lever with all his weight and both hands. The boy said, in explanation, that he didn't know anything about a boiler, but he supposed that if he "let any steam get out of that thing on top it would blow him and the shop to smithereens." "Ah!" said he, "I'm glad ye came, for I couldn't hold it much longer." It evidently came very near being another mysterious (if) explosion.

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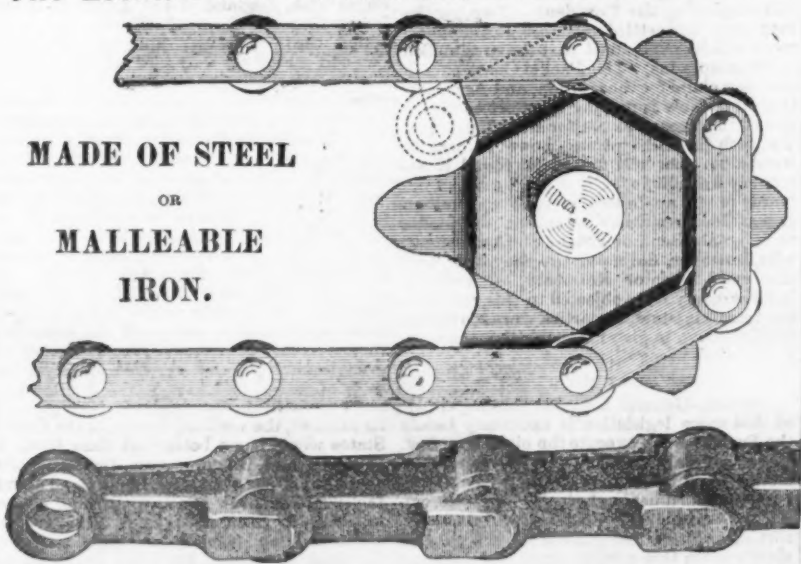
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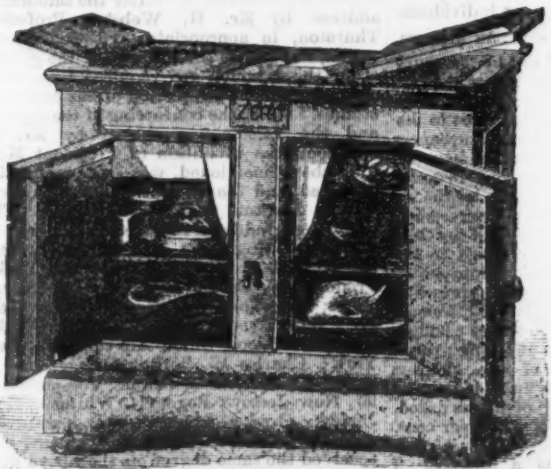
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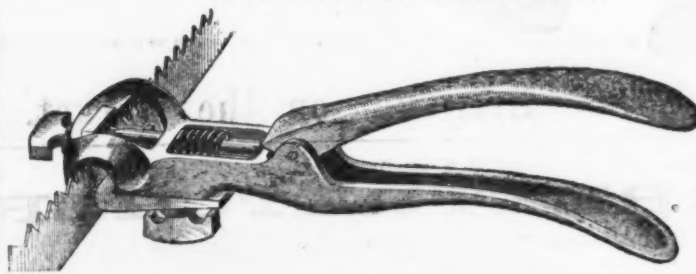
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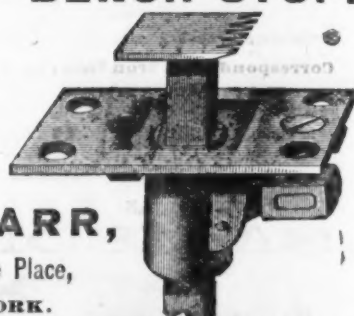
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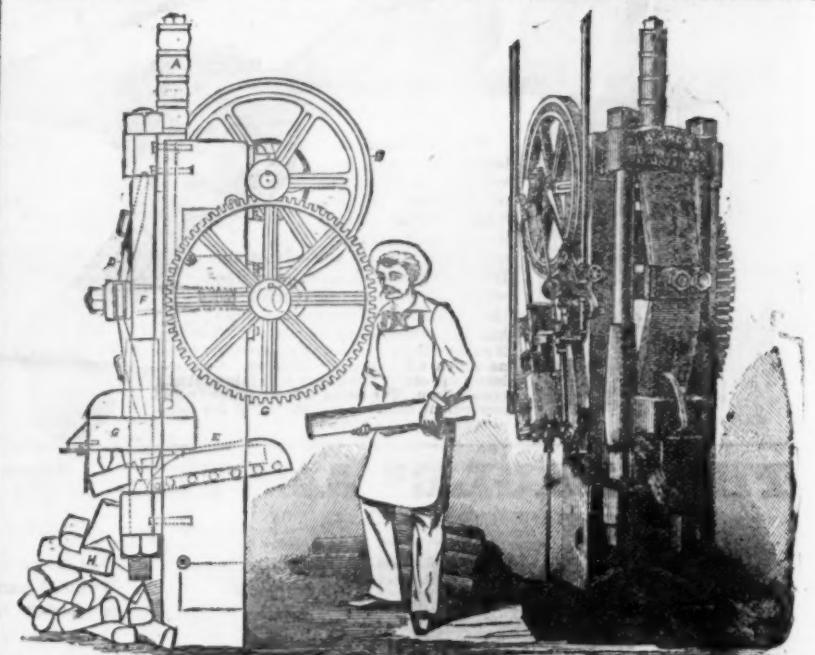
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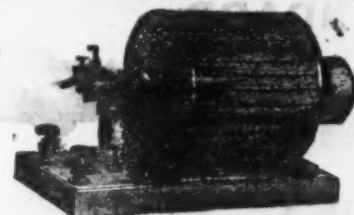
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Automatic Trimming and Squaring Machine.

The annexed illustration represents an automatic trimming and squaring machine just completed by Mr. E. W. Bliss, Plymouth, Pearl and John Streets, Brooklyn, N. Y. The machine is an entire novelty in its way, and we believe it is the first squaring machine ever built in which rotary shears have been employed. It trims accurately square 14 by 20 inch plates at the rate of 45 sheets per minute. The machine consists of a plain iron frame, carrying through its center slides and grippers by which the plate is moved. The sheet is fed in at the left-hand end of the machine by a spring guide, and held squarely against a stop. Grippers then carry it through the shears and under the feed rollers, which take the buckle out of it. Passing to the right hand of the machine, it stops for an instant, and the swinging arms, shown in the cut as standing out at an angle, drop down, pushing it against a stop, seize it and then draw it out at right angles to its former motion. In doing this two pairs of cutters trim the opposite ends, while rollers hold it and prevent it from springing. The second pair of shears are of course set at right angles to the first. This leaves the sheet trimmed on all four of its edges, which are straight, the opposite sides being parallel. In this form the machine is specially adapted to trimming and squaring 14 by 20 sheets for the bodies of five-gallon petroleum cans. The machine, however, is capable of being made to trim and cut sheets of tin for pint-can bodies. In some cases, the machine may be made to cut a strip from one side of the sheet at the same time that squaring is done, and to cut up the remaining portion of the sheet into two, three or four pieces, as may be desired. The weight complete is about 3500 pounds. The driving pulleys are 16 inches in diameter, with 4-inch facings, and make about 16 revolutions per minute. It is geared 4 to 1.

The Iron Ore Resources of England.

The duration of ironstone in England is a subject of profound interest and importance, affecting, in no small measure, the wealth and power of the country, and the internal exhaustion of the once vast supplies is, therefore, worthy of some attention. Great changes have been experienced in this direction within the past 30 years, and the mines which at that time yielded the most abundant supplies are now rapidly dying out and giving way to new discoveries. With the exception of Lancashire and Cumberland, so well known for their hematite stone, the ores were generally raised from coal measures, or at least were connected with them. In South Wales the lower coal measures in many cases contain considerable quantities of ironstone, which, in Staffordshire, occurs below the thick coal and associated with shale. The West Riding of Yorkshire, Derbyshire, Shropshire and other counties where coal is extensively worked, were large producers of iron ore, but this is now all changed, and the greatest producers of stone, and those that will long outlast those fields connected with the coal measures, were scarcely known 30 years ago, many having been discovered only within the last few years. These new fields are in no way connected with coal, being, in many cases, very far removed from such deposits. It was in 1850 that ironstone was discovered in Cleveland, which now yields over two-fifths of all the ore used, and which is the greatest iron and steel producing locality in the kingdom. About three years later iron ore was found in Northamptonshire, and a large field developed at Wellingborough. The ore has, however, also been worked in different parts of the country, and large supplies are now sent to South Wales, Derbyshire, Nottingham, and some parts of the West Riding of Yorkshire.

The great advantage attending the Northamptonshire ore is that it may be obtained at a short distance below the surface and at a very small cost. The production now stands next to Cleveland, and the deposits may be said to be almost inexhaustible, and it is taken by ironmasters in different counties in preference to the deposits near to them in connection with the coal. A few years after having discovered the Northamptonshire deposit, ores of a similar character were discovered in Wiltshire, and four furnaces were erected with the view of conducting smelting operations. In 1859 a field of ironstone was discovered in North Lincolnshire, and it was found that the stone permeated a large part of the county and was of good quality. The two deposits just mentioned are of immense proportions and fairly rival Cleveland, the ore being richer in metallic iron. Rutlandshire also yields a considerable supply, and railway connections, which are now rapidly nearing completion, will greatly facilitate the transportation of the ore. The latest discovery of ore was made in Oxfordshire, where it is worked on the estate of the Duke of Marlborough. All these ironstones appear to be identical, and these collieries, it may be said, have an uninterrupted range through Dorsetshire, Somersetshire, Gloucestershire, Oxfordshire, Northamptonshire, Rutlandshire, Lincolnshire, and into Yorkshire on its eastern border. It is evident, therefore, that the ironstone measures that are in no way connected with coal are those which will be depended upon in the future, and it is highly probable that they will be found in other countries than those in which they are now met with, since their extent cannot be even approximately determined. Their immense proportions, and the statements that they are practically inexhaustible, therefore, dispel all immediate danger of an iron-ore "famine."

Sparks from Cast Iron Gears.—In regard to the question whether the friction of cast-iron gears will produce sparks, a subject previously mentioned in our columns, a correspondent of the *American Miller* writes as follows: "I once had a pair of miter wheels running in the pit of my burst frame, driving two pair of runners; they were small wheels, some 2 feet in diameter, with about 7 inches face, both of them having the same number of cogs. One of them was on the upright shaft, it not being true on account of its having a coupling off. I took them apart

in order to have the toe of the upright shaft worked on, and I forgot to number the cogs. I had been running them some time, and they had worn with shoulders; I kept them well greased; a pretty large pile of grease had accumulated right under the wheels. After having the toe of the shaft repaired, I put them in gear again and started them to work. Having failed to put the cogs in the same places as they were before, it caused them to come in contact with the shoulders, and the friction being heavy, it caused them to rub or grind out sparks, which set the pile of grease on fire, and would have burned the mill if I had not discovered it in time. I have very little doubt but that a great many mill fires may be traced to the throwing of sparks by gears. There was no possibility of a fire starting in my mill except by these wheels. The insurance companies are laboring under a very great mistake if they think that cast-iron gearing will not produce sparks, and the fact above mentioned should be known among machinists."

Some Plain Truths About Tin Plates.

The subjects of brands and qualities of tin plate at the present time are attracting so much attention that a brief account of what tin plates really are and what are the elements of their good and bad qualities, will be of interest to our readers.

Of the tin plates of commerce there are two general kinds: One is known as "tin plate," or "bright plate," and the other as "terne plate," or "roofing plate." The coating of the former is supposed to be pure tin, and the bright appearance which it pre-

sents gives it the name by which it is most commonly designated, "bright plate." The coating of the second kind is composed chiefly of lead, which, being dull, or dead, in appearance, gives it the name usually applied to it, "terne," that term being a French word signifying "dull of appearance." In considering tin plate for any purpose whatever, it is necessary to examine both the plate and the coating with which it is covered. There are several important particulars to be taken into account with respect to each of these items in making a selection for any purpose.

Let us first give attention to the plate. Of the iron employed in the manufacture of tin plates there are two generally recognized grades or qualities, which are designated as "coke" and "charcoal" respectively. Originally these terms referred to the processes employed in making the iron. Later they indicate the quality in a somewhat arbitrary manner, irrespective of the particular fuel burned in the process of manufacturing the iron. In any event, it is impossible for the consumer to ascertain by what process the iron in his plates was made. Therefore, for him, at least, these terms are nothing more than general indications of the qualities of the plates to which they are applied.

Speaking in the most general terms, coke plates are inferior to charcoal plates. There are such variations in the so-called charcoal plates, however, that almost every degree of quality may be found among them alone. Hence, it does not follow that a charcoal plate is necessarily superior to all coke plates. Certain it is that the best qualities of coke plates are much to be preferred to the poorer grades of charcoal plates. With different qualities of coke plates, still additional designating terms are brought into requisition. Coke plates are frequently designated as first quality, second quality or third quality. A like classification is sometimes applied to charcoal plates. Hence, the terms "first quality" and "second quality," or "first grade" and "second grade," are frequently met. In similar efforts to classify plates in a general way with respect to quality, the terms "prime charcoals" and "best charcoals" have been introduced. The use of these two terms is really more common than those to which we first alluded. By reason of their very common use, however, they have lost much of their literal significance. A fair interpretation of the term "prime charcoal" at the present time would probably be a fair article, a

plate of average quality, but not the very best. The loss of meaning in the other term is still more marked. "Best charcoals" at the present day are not the best made, but rather are plates a little under a fair average in point of quality. Whatever the term may have signified when first used, it is now employed in what may be termed a technical sense alone. Plates of different quality are made in various sizes and different thicknesses or gauges. The commoner sizes in use are 10 by 14, 14 by 20, 20 by 28, 10 by 20, 12 by 12, &c. Each of these sizes is made of different gauges. The gauge marks employed upon tin plates are peculiar, and are unlike gauge marks used anywhere else. The thickness of plate most generally used in this country is indicated by the mark "IC," and by ordinary wire gauge is equal to about No. 29. The next thickness is marked "IX," and by wire gauge is nearly equivalent to No. 27. Following these are "IXX" and "IXXX," which also very nearly correspond to Nos. 26 and 25 of the wire gauge respectively; additional X's represent still heavier gauges. It is not worth while in this connection to discuss the system of marks indicating thickness of plates in use, nor to attempt to account for certain arbitrary characters, such as those used in designating what are called "hundred" brands. Our purpose is merely to call attention to those features in connection with tin plate which will make our readers intelligent in judging of qualities, and in writing specifications.

The accompanying table gives the gauge marks, number of sheets per box, gross weight per box, regular sizes of tin and terne plates as now made up, and is

the sheet in the form of coating as would naturally adhere to it. Hence a thick, or as it is sometimes called, a wire, edge may be noticed on one side of many sheets. This also accounts for the extra heavy coating to be observed in spots where the tin had cooled before running off the sheet. By the process commonly known as "patent rolling" all this has been changed, and plates are now offered in the market the outward appearance of which is fully equal to the plates of an earlier period, but the coating of which is probably not one-third as thick. The thickness of the coating upon a sheet of tin plate may be easily tested by the use of a sharp-pointed knife. Use the knife as a plow and turn up a fine shaving of the coating. The naked eye will ordinarily suffice to judge of the thickness, but most satisfactory results are to be obtained by employing a magnifying glass in looking at the sample. By experimenting in this way upon a sheet of well-coated tin plate and patent rolled plate there will be no difficulty in arriving at a conclusion as to the relative quality and durability of the two samples tested.

Besides the kind of coating, quality of coating and thickness of coating upon the plate there is the matter of the evenness of the coating to be considered. For some purposes the patent rolled plate is to be preferred to the old-fashioned dipped plate, so far as appearance alone is concerned, because there are no blotches on the coating caused by undue thickness in certain places. However, it is not impossible to have an evenly-coated hand-dipped plate, and, therefore, this becomes an indication of quality. Uneven coating, unduly thick edges, blotches

by themselves in packing. Hence it follows that the wasters of almost any prominent brand of tin are, at some time or another, upon the market. Wasters are indicated, in branding the box, by placing the term itself in a conspicuous position across the end of the box, or by the initial W placed immediately after the brand, or immediately after the gauge mark, as, for example, "IC, W," or "IX, W."

All that we have said with reference to tin plates may be briefly summarized and put into convenient shape for reference, as follows:

Tin Plate is thin sheet iron coated with tin.

IC, IX, IXX, &c., refer to thickness of plates.

Charcoal and Coke refer to quality of iron in the plates.

Bright and Terne, or Leaded, refer to the coating of the plates.

10 x 14, 14 x 20, 10 x 20, &c., branded upon the boxes, indicates the size of the plates.

The Brand is some name, or device, or arrangement of letters of the general nature of a trade-mark, by which the quality of tin contained in the boxes is supposed to be indicated.

This brief summary shows how many points are to be considered upon the part of the consumer when selecting a tin plate for any specified purpose. When it is considered how many makers' brands there are in the market, how many fictitious brands are also in use, and further, that the quality of any make of tin plate is variable and uncertain, it will be seen how little value a brand is as compared with the actual test of the plates themselves. For many years large consumers of tin plates in various lines of trade have found it desirable to ignore brands entirely, and to buy and use plates upon the quality, determined by actual test.

The Wire Gauge Controversy.

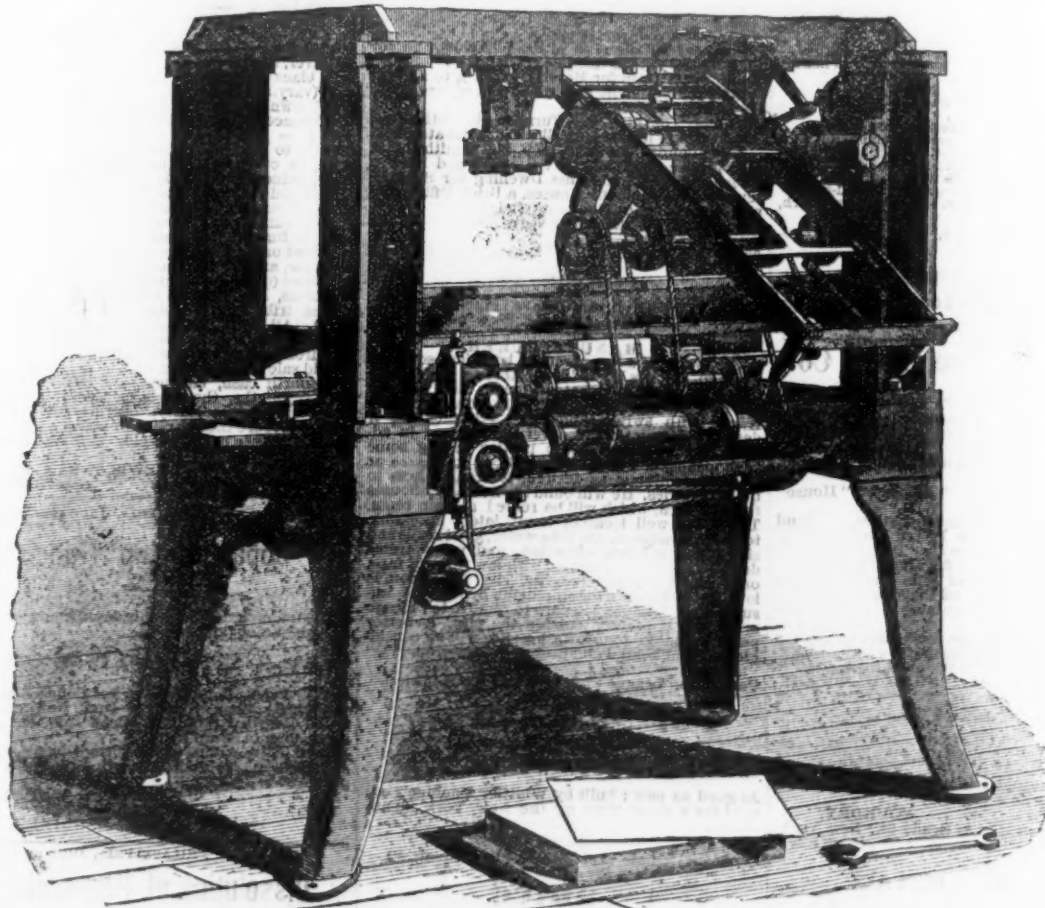
The arguments pro and con in the wire gauge controversy in England continue to fill the columns of our English exchanges. The following is an editorial from the *Iron-monger* of a recent date:

The battle of the wire gauges still rages, and does not seem to be nearer its climax than it has been any time these six months. Judging from the published utterances of the champions of the several styles and sizes at present in force, there appears to be little or no disposition in favor of a compromise; indeed, there is more heat in the controversy as it is prolonged. Under these conflicting conditions, it is difficult to venture anything resembling prophecy as to the result. The Board of Trade are understood to have issued about one hundred and sixty circulars to manufacturers in this country, and it will be odd if almost as many different opinions and suggestions are not forwarded to the department in response. Each of the districts affected is pretty certain to "go for its own hand," besides which individual makers have crotchets of their own to air. That being the case, the Board of Trade will find little or no new information in the replies, but they will, at least, be convinced of the energetic manner in which the wire manufacturers agree to differ, and the great variety of opinion that exists on this head. Having no reliable guidance from those to whom they appealed, it is not impossible that the officials may elect to constitute themselves arbiters, and may introduce the system which they deem best. If we are to believe Mr. J. B. Brown, of London, Mr. Chaney, the head of the Standards Department of the Board of Trade, is in favor of the metrical system, hence we may anticipate that that plan will form the basis of the new arrangement. It would be supported by the Sheffield and certain other manufacturers, but it must be the decimal part of some English denomination of measure, and, therefore, could not be the metrical system pure and simple. We might thus have still another gauge legalized—indeed, it is suggested in our correspondence columns to-day by a gentleman well known in the North of England. Failing the consent of the majority of the wire trade, such an addition to our already too great wealth in this direction is wholly undesirable. That consent is not likely to be obtained; hence it is improbable that we are near the goal which everybody professes we ought to attain. What then, must be done? Either we must stand still or move on; but if we move, in what direction shall we bend our steps? Birmingham appears to be indifferent and Sheffield apathetic; but Warrington is pugilistic and Leeds is not to be accused of diffidence. All have claims to be heard in the settlement of this important question, but all cannot prevail. Compromise is inevitable, and the sooner it is formally arranged the better for the well-being of the wire and metal-rolling industries.

Electrical Exhibition at Vienna.—It is reported that an International Electrical Exhibition, to be held at Vienna this autumn, is now under consideration, considerable progress having already been made toward organizing the exhibition. Branch committees have been formed, and eminent electricians of Austria, Germany, France, Belgium and Holland are said to have promised support. The increasing importance of electricity in its application in various departments, especially in mining and metallurgy, warrants the assumption that the projected exhibition will probably be patronized by a large number of persons engaged in these pursuits.

Prof. Nordenskjöld during his Arctic voyage was perplexed by the question, What becomes of the bodies of animals which die a natural death? He very seldom found such remains, and declared that on Spitzbergen it was easier to find vertebrae of monster extinct reptiles than the bones of the seal, walrus or bird of the present day. The problem is yet unsolved. It must be that the living animals eat the dead ones.

The smallest circular saw in practical use is a disk about the size of a five-cent piece, being employed for cutting the slits in gold pens. They are about as thick as ordinary paper, and make 400 revolutions per minute, this high speed keeping them rigid, notwithstanding their extreme thinness.



Automatic Trimming and Squaring Machine, Built by E. W. Bliss, Brooklyn, N. Y.

the recognized standard of importers and jobbers:

Approx. thick- ness by wire gauge.	Gauge mark.	Size.	No. of sheets per box.	Av. weight, incl. box, lbs.
No. 29	IC	10 x 14	225	125
No. 27	IX	10 x 14	225	150
No. 25	IXX	10 x 14	225	170
No. 23	IXXX	10 x 14	225	190
No. 21	IC	12 x 12	225	120
No. 19	IX	12 x 12	225	150
No. 17	IXX	12 x 12	225	170
No. 15	IXXX	12 x 12	225	190
No. 13	IC	14 x 20	112	120
No. 11	IX	14 x 20	112	150
No. 9	IXX	14 x 20	112	170
No. 7	IXXX	14 x 20	112	190
No. 5	IC	16 x 24	56	120
No. 3	IX	16 x 24	56	150
No. 1	IXX	16 x 24	56	170
No. 29	SDX	11 x 15	300	80
No. 27	SDX	11 x 15	300	100
No. 25	SDX	11 x 15	300	120
No. 23	SDX	11 x 15	300	140
No. 21	DC	12½ x 17	100	105
No. 19	DC	12½ x 17	100	135
No. 17	DCX	12½ x 17	100	155
No. 15	DCX	12½ x 17	100	175
No. 13	DCXX	12½ x 17	100	195
No. 11	DCXX	12½ x 17	100	215
No. 9	DCXXX	12½ x 17	100	235
No. 7	DCXXX	12½ x 17	100	255
No. 5	IC	14 x 14	225	120
No. 3	IX	14 x 14	225	150
No. 1	IXX	14 x 14	225	170
No. 29	IXXX	14 x 14	225	190
No. 27	IXX	14 x 14	225	210
No. 25	IXX	14 x 14	225	230
No. 23	IXXX	14 x 14	225	250
No. 21	IXX	14 x 14	225	270
No. 19	IXX	14 x 14	225	290
No. 17	IXXX	14 x 14	225	310
No. 15	IXXX	14 x 14	225	330
No. 13	IXX	14 x 14	225	350
No. 11	IXX	14 x 14	225	370
No. 9	IXXX	14 x 14	225	390
No. 7	IXXX	14 x 14	225	410

From what has preceded it will be seen that the size and gauge of a plate is a matter entirely distinct from the coating. Whatever may be the quality of the iron out of which the plate is made, whatever may be its size and whatever its thickness, it may be coated with pure tin, with some alloy of tin or with a coating the principal ingredient of which is lead, producing terne plates, as already described. Further, a heavy coating may be applied or a very light one may be used. The consumer, in selecting tin plate, has all these several points to consider.

The principal defect in tin plates at the present time with respect to their coating, whether bright or terne, is in the thickness of the coating. The original process of manufacture was to dip each sheet in such a manner as to allow as much metal to remain on

or splashes on the surface, are for the most part indications of careless workmanship. Some plates are not perfectly coated, owing to particles of scale adhering to the plate over which the coating does not close. The trouble in such cases is in the imperfect cleaning of the plate before dipping. The surface indications of such plates in the finished plates are generally minute black spots commonly distinguishable by the eye, but always to be quickly perceived by the aid of a glass. In the case of terne plates used in roofing, the effect of such spots is to show rust streaks after the first exposure, while the utter destruction of the plate is only a question of a very short time.

The boxes in which tin plates are packed receive certain marks or brands upon their sides and ends which are generally recognized in the trade. The general quality of the plates contained in the boxes is indicated by the words "charcoal" or "coke." The character of the coating is quite generally indicated by the terms "bright" or "terne." Sometimes the size of the plate is branded on the box and sometimes it is omitted. The thickness is always indicated by "IC," "IX," or "IXX," as the case may be. Besides these various marks there is the private trade-mark of the importer, which is known as the brand, and which always appears upon the boxes. Brands of the plate, as commonly recognized in this market, are of three general classes. First, there are "makers' brands," by which is meant brands that are owned and controlled by makers of the plates; second, there are "private brands," which we will define as brands owned and controlled by importers and jobbers; and third, for the lack of a better term, we will designate "wildcat" brands, by which is meant brands of no definite standing, and which are devised and applied to plates of various grades solely for the purpose of enhancing their selling price. The latter term is not in so general use as the term "private brands," which is frequently used in the sense last defined. We purposely depart from the recognized division in the use of these terms in order to better show the three classes of brands in the market, and generally recognized by whatever terms they may be indicated.

A mark sometimes to be found upon boxes of tin plate, and to which it is well to call our readers' attention in this connection, is that of "wasters." The term is used to designate the defective sheets of a box of tin plate, which are, for obvious reasons, kept

TRADE PUBLICATIONS.

TOOLS FOR RAILWAY REPAIR SHOPS.

The L. B. Flanders Machine Works, Messrs. Pedrick & Ayer, No. 1025 Hamilton street, Philadelphia, Penn., have issued a neat catalogue for 1892, describing the special tools for railway repair shops made by this establishment. The first article illustrated is Flanders' patent crank-pin machine, for turning off crank-pins in position and while the wheels are under the engine. This is a very useful device, and has been lately improved. It does its work in a very rapid and satisfactory manner, maintaining the original centers of the pin. It is used quite extensively by some of the most important railways in the country, among which may be mentioned the Pennsylvania Company, the Chicago and Grand Trunk Railway Company, Union Pacific Company, and others. The second device described is a portable valve-seat rotary planing machine, manufactured by this company. Following this is Flanders' improved locomotive-cylinder boring machine, which is adapted to boring out locomotive cylinders in their places by simply removing the heads and piston. Among the companies using this device may be mentioned the Illinois Central Company, Cleveland and Pittsburgh Company, the Chicago, Burlington and Quincy Railroad Company; and among the private concerns are the Baldwin Locomotive Works, the Rogers Locomotive Works, William Sellers, and others. A number of other improved tools are shown, among which may be mentioned Flanders' radius planer, for planing links, blocks and circular work on an ordinary planer. A steam chest seat milling machine, and a small portable engine called the "Gyp," specially made by this company for running its tools. The cylinder is 3 by 4 inches, upright. Independent of the fly-wheel the engine weighs only 115 pounds.

THE PERLESS TRACTION ENGINE.

We have received from the Geiser Manufacturing Co., Waynesboro, Pa., their illustrated catalogue for the current year, in which we find a description of the Landis "Peerless" traction or road locomotive, manufactured by this company. This engine was awarded the gold medal at the Ninth Cincinnati Industrial Exhibition, held at Cincinnati last fall, the specification of the jurors being for excellence of design and construction, and for superior performance during the expert test. At the trial of traction engines at Atlanta, Georgia, last December, this locomotive required only 6.94 horse-power for drawing a load of 11 tons one-half mile in 6 1/2 minutes. Besides this form of engine the company manufacture a portable steam engine on wheels, adapted for farming use; also the same engine on skids, and what is called the "Domestic" steam engine, semiportable in character, of from 2 to 4 horse-power. In addition to engines the company make thrashing machines, separators, saw-mills and various other specialties.

Iron Mines at Diolette.—The British Consul at Cherbourg, in the course of his report on the general trade of France, states that the iron mines at Diolette, France, have been worked for some years past without success. Some new companies were recently formed for the development of the deposits, and entered into the possession of the mines at the beginning of the present year. The shafts appear to be sunk into a promontory jutting into the sea, and pass through layers of soft granite. The mines have been worked to the length of about 650 feet, and the ore is said to be very rich in iron. The successful development of the mine is, however, rendered very doubtful, since the workable lodes extend for some distance under the sea and gradually die out toward the land. Notwithstanding the great depth at which the ore is worked the water enters in considerable quantities, rendering continuous pumping indispensable, and greatly increasing the cost of extraction. The pumping is effected by a steam engine, which, by means of a strap working on wheels, lowers into the shaft a deep spheroidal bucket fitted with a valve, which is forced open when the bottom of the shaft is reached. The bucket then fills with water, and when hauled up again the weight of the latter firmly closes the valve, which is opened as soon as the surface is reached, allowing the water to escape by means of suitable conduits. This process of pumping is carried on continually. Notwithstanding the heavy expenses under which operations are carried on, the promoters of the new companies believe that the richness of the ore will ultimately compensate for all the drawbacks.

Special Notices.

ALL KINDS OF

Gray Iron Castings

FINE QUALITY AND FINISH.

JOHN KEPPELMAN,

Cor. Second and Court Sts., Reading, Pa.

WANTED. TRAVELING SALESMAN

To sell full line of Manufactured Hardware to the Jobbing trade in New York, Pennsylvania and New England States, including New York City, Philadelphia and Boston, for one of the largest manufacturing concerns in the country. Must be a thorough hardware man with a good established trade in the above territory. Address MANUFACTURER, Office of The Iron Age, 83 Reade St., New York.

For Sale.

10 in. Merchant Mill, 56 Rolls.

10 in. Merchant Mill, 6 ft. Rolls.

Tilt Hammer for Blooms.

2 1/2 in. Reynolds Turbines.

Lever Shears, Cam motion.

Crocodile Squeezer.

Heavy Roll Lathe, with small auxiliary Lathe.

2-ton Chain Blocks, double length chain.

A. G. BROOKS & WINEBRENER,

261 N. 3d St., Philadelphia.

TO MANUFACTURERS.—A gentleman who has

an office in New York, is desirous of representing

goods suitable for the Hardware and

House Furnishing Goods Trade.

Address MANUFACTURERS' AGENT,

Office of The Iron Age, 83 Reade St., New York.

SITUATION WANTED.—By an experienced man

to solicit orders for Pig Iron and Iron trade in

general. Salary or commission. Address FOX,

Office of The Iron Age, 83 Reade St., New York.

Special Notices.

SECOND-HAND AND NEW

MACHINERY.

JUNE 15, 1892.

The following new and improved Machinery Tools are part of what we have recently delivered:

- 1 1/2 in. x 3 in. x 8 ft. Planer. New. June.
- 1 1/2 in. swing, 16 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 20 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 24 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 28 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 32 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 36 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 40 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 44 ft. bed New Engine Lathe. June.
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- 1 1/2 in. swing, 52 ft. bed New Engine Lathe. June.
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- 1 1/2 in. swing, 188 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 192 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 196 ft. bed New Engine Lathe. June.
- 1 1/2 in. swing, 200 ft. bed New Engine Lathe. June.

The following on hand.

2 1/2 in. swing, 18 ft. bed Engine Lathe. New.

1 1/2 in. swing, 16 ft. bed Engine Lathe. New.

1 1/2 in. swing, 14 ft. bed Engine Lathe. New.

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1 1/2 in. swing, 1/324518552586026726783156020576256 ft. bed Engine Lathe. New.

1 1/2 in. swing, 1/649037105172053453566312041152512 ft. bed Engine Lathe. New.

1 1/2 in. swing, 1/1298074210344106907132624082305024 ft. bed Engine Lathe. New.

Special Notices.

NEW IRON WORKING MACHINERY.

ENGINE LATHES.

One 36 in. swing, triple-gear (bed made to suit).
One 24 in. swing, x 14 ft. bed. Blaisdell. June delivery.
One 20 in. swing, x 12 ft. bed. Fitchburg. June delivery.
One 18 in. swing, x 10 ft. bed. Fitchburg. On hand.
One 16 in. swing, x 8 ft. bed. Johnson. On hand.
One 14 in. swing, x 6 ft. bed. Fitchburg. On hand.
One 12 in. swing, x 4 ft. bed. Fitchburg. On hand.
One 10 in. swing, x 2 ft. bed. Blair. On hand.
One 8 in. swing, x 1 ft. bed. Fitchburg. June delivery.
One 6 in. swing, x 1/2 ft. bed. Fitchburg. June delivery.

PLANERS AND SHAPERS.

One 25 in. x 25 in. x 8 ft. Fitchburg. On hand.
One 20 in. x 20 in. x 10 ft. Fitchburg. On hand.
One 18 in. x 18 in. x 12 ft. Fitch

METALS.

Copper.—Sales of Lake Copper have been confined for the week to some 200,000 pounds at 18½¢ @ 18¼¢, while "Anchor" brand and Baltimore are worth 17½¢, perhaps to be shaded in a few instances to 17¼¢. Manufacturers state that they are still engaged on old orders, but that there is a lack of fresh ones. The fact is that the strike epidemic still casts restraint on the enterprise of manufacturers and others in the metal trade. Fortunately, crop prospects are brightening from day to day as the fine weather continues; after a while, we presume, we shall emerge from this momentarily dubious spell all right, all of us. So in the general jobbing trade in the metal line a better feeling, we are told, is perceptible this week. For the moment we shall, however, have to confront the usually dreary 4th of July period drawing near. After it is gone through, the outlook will be more clearly defined, and the trade will then gradually prepare for the fall season. London yesterday fluctuated, with Chili Bars between £67. 10/ and £68. 10/. We receive from there to-day the ensuing cablegram: "Considerable falling off in demand and prices tending in buyers' favor. Transactions during week small. Best Selected, £73 @ £74; Chili Bars, £66. 15/ @ £67; and by mail we have the following: "London, June 3.—This market has been strong for Chili Bars, and prices have shown a progressive upward tendency, and this has had an influence on prices for other descriptions, although not sufficient to have any material alteration in quotations. As regards the amount of business that has been doing, it must be considered limited, although for the time of the year an average number of transactions have been carried through. The amount of business, however, that is now doing does not appear the chief support to the market, for it is open to question whether improved prices are warranted by that which is now being carried through." Manufacturers have made no change in prices. They quote: Bottoms, 31¢ @ 32¢; Braziers, 30¢ @ 31¢; Circles, 33¢ @ 34¢; Sheathing, 28¢, and Bolt Copper, 30¢; Segment Sheets, 33¢; Fire-box ditto, 30¢.

Tin.—The market, so far as large lots are concerned, has shown no increased activity, but the jobbing trade is reported as being satisfactory. We quote: Straits Tin, 21½¢ @ 21¼¢, and Lamb and Flag, 22½¢ @ 22¢, large lines. London was at one moment yesterday called to have given way to £94. 10/ with Straits Tin, but subsequently again came £97. We hear from there to-day as under: "Market dull and prices weak. The demand has declined. Straits Tin, spot, £95. 15/." "London, June 3.—There is not very much change in the state of this market, prices at the opening of the week were rather easy, but they have since slightly recovered again. On Wednesday last the Banca sale realized an average price of 58½¢ g., but this produced but little effect, and a steady business continued to be transacted. The statistics published on the 1st inst. must, taken on the whole, be reckoned satisfactory, as they show very fair deliveries for the month of May, thus testifying that notwithstanding the various changes which from time to time take place in this metal, yet the deliveries continue upon a fairly large scale." **Tin Plates.**—Quite a business has been transacted in Coke Tin, which is decidedly firmer at \$5.20. We quote, toward the close, large lines, ordinary brands, 10 box: Charcoal Bright, \$6 @ \$6.25; ditto Tarnes, \$5.37½ @ \$5.50; Coke Tin, \$5.20, and ditto Tarnes, \$5.12½ @ \$5.25. In England the article seems to inspire more and more confidence; they quoted, 10 cable, yesterday, Coke Tin, 15/6 @ 15/9, and Charcoal, 15/6 @ 20/. We are cabled from London, to-day, as under: "Market quiet, with demand and prices steady."

Lead.—Not much beyond a retail trade has been transacted during the week, some 200 or 300 tons changing hands in this way, at \$4.65 @ \$4.70, the market closing dull, at \$4.65 @ \$4.60, while of Refined some sales were effected at 4¼¢. St. Louis has shown greater stiffness, at \$4.30 for Hard, and 4½¢ for Soft, with 35¢ freight. At \$4.55 at New York the larger consumers would probably be willing to take hold of Common Domestic Lead to some extent. From London we are cabled to the following effect, direct, to-day: "Business continues light, with prices a little firmer. Common English Pig, £14. 10/ @ £14. 15/." Manufacturers have been subject to no change since our last. We quote: Pipe, 7½¢; Sheet, 8¢; Tin-lined Pipe, 15¢; and Block, 45¢; all less 10% to the trade.

Spelter and Zinc.—Common Spelter is unfavorably influenced by the strikes in the Iron line, where it nowadays plays such an important part for galvanizing purposes. Accounts from Europe are not of a stirring nature either, and the result of these adverse circumstances is increased dullness and weakness. Domestic being nominally worth \$5.45 @ \$5.50, and Silesian, 5½¢ @ 5¾¢. Whether true or not, we are told that some Stobber offered as low as \$5.40. We quote Bertha Refined, 8¢; and Bergengot, 9½¢. **Sheet Zinc.**—The market is rather quiet at 7½¢ @ 7¾¢. Our cablegram from London reads as under: "No feature of interest to report, the market ruling dull and prices weak. Ordinary, \$17 @ \$17. 10/ at shipping port."

Antimony.—Great dullness prevails at 14¢ for Cookson and 14½¢ for Hallett.

FOREIGN TRADE MOVEMENTS.

The following is a summary of foreign trade movements for the past week:

IMPORTS.

For the week ending June 10:

	1880.	1881.	1882.
Total.....	\$11,945,215	\$9,307,552	\$7,713,118
Prev. reported.....	\$11,945,215	\$9,307,552	\$7,713,118

Since Jan. 1... \$93,005,874 \$101,114,147 \$227,594,495

Included in the imports were articles of merchandise valued as follows:

	Quantity.	Value.
Antimony.....	229	\$2,291
Brass goods.....	45	4,240
Bismuth.....	9	935
Bronzes.....	8	1,170
Chains and anchors.....	40	1,772

Clocks.....	14	5,537
Copper.....	17,192	17,192
Cutlery.....	135	30,860
Gas fixtures.....	1	549
Guns.....	16,857	16,857
Hardware.....	95	3,149
Iron, pig, tons.....	3,565	77,395
Iron, sheet, tons.....	130	7,381
Iron, ore, tons.....	295	958
Iron, other, tons.....	1,515	47,588
Machinery.....	210	11,188
Metal goods.....	218	18,031
Needles.....	1	53
Old metal.....	14	5,033
Old metal.....	14	5,033
Platina.....	4,787	4,787
Plated ware.....	2	10
Perforated caps.....	103	4,515
Plumbago.....	141	959
Quicksilver.....	250	7,505
Saddlery.....	11	1,191
Steel.....	59,889	274,302
Spelter.....	555,510	22,638
Silverware.....	59,889	15,389
Tin, boxes.....	28,084	402,359
Tin, slabs, 5,697; 612,331 lbs.....	27,084	108,208
Wire.....	135	4,238
Zinc, lbs.....	230,450	9,958

The quantity of leading articles compares with previous dates as follows:

	For the week.	23 weeks.	Same time.
	1882.	1881.	1881.
Cutlery, pkgs.....	3	3,481	3,185
Hardware, pkgs.....	3	480	535
Iron, R. R. bars.....	70,841	143,751	15,389
Lead, pkgs.....	16,544	15,389	15,389
Steel, pkgs.....	59,889	917,354	402,359
Tin, boxes.....	28,084	975,091	678,378
Tin slabs, lbs.....	612,331	7,755,633	6,912,765

EXPORTS OF SPECIES.

For the week ended June 10:

Total.....	\$5,506,451
Previously reported.....	\$5,506,451
Total since January 1, 1882.....	\$31,673,999
Same time in 1881.....	\$1,447,092
Same time in 1880.....	\$4,251,380
Same time in 1879.....	\$10,765,092
Same time in 1878.....	\$8,109,933
Same time in 1877.....	\$17,791,729
Same time in 1876.....	\$20,856,481
Same time in 1875.....	\$48,803,782
Same time in 1874.....	\$26,656,102
Same time in 1873.....	\$4,929,140
Same time in 1872.....	\$12,683,580

EXPORTS EXCLUSIVE OF SPECIES.

For the week ended June 13:

	1880.	1881.	1882.
Total.....	\$10,802,522	\$8,048,581	\$5,302,476
Prev. reported.	<u>159,972,954</u>	<u>162,200,961</u>	<u>135,064,675</u>
Since Jan 1. . .	\$170,775,476	\$170,390,542	\$140,367,151

IMPORTS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending June 14, 1882:

Hardware.

Baldwin Bros. & Co.	3
Gun barrels, cs.	3
Baker, Hermann & Co.	40
Chains, cs.	40
Cases, 4	40
Cases, 33	40
Brown Bros. & Co.	74
Machinery, pkgs.	74
Burge N. L. & Sons.	74
Rosier machines, pkgs.	74
Coombs, Crosby & Co.	192
Machinery, pkgs.	192
Churchill C. & Co.	3
Machinery, cs.	3
Curley J. & Bros.	2
Cases, 2	2
Drexel, Morgan & Co.	11
Cases, 11	11
Degrauw, Aymar & Co.	90
Chain, lengths, 9	90
Chain, cs., 12	405
Dolge A.	2045
Cases, 1	2045
Eggers & Heinlein.	4
Arms, cs., 4	4
Field Alfred & Co.	3
Cutlery, cs., 3	3
Cases, 2	3
Fleissman & Co.	23
Ironware, cs., 23	23
Folsom H. & D.	15
Arms, cs., 15	15
French, Edie & Co.	5
Machinery, cs., 5	5
Godfrey Chas. J.	10
Arms, cs., 10	10
Graef Cutlery Co.	7
Cutlery, cs., 7	7
Hartley & Graham.	7
Guns, pkgs., 7	7
Cases, 3	7
Hamacher A. & Co.	14
Ironware, cs., 14	14
Moore's Sons J. F.	14
Mdse., cs., 4	14
Arms, cs., 2	14
Merchants' Dis. Co.	32
Arms, cs., 32	32
Pim, Forwood & Co.	14
Shovels, bdis., 5	14
Schuyler & Duane.	24
Cases, 24	24
Schuyler, Daly & Co.	74
Gales, cs., 8	74
Seibach E.	771
Machinery, pkgs., 771	771
Waelaer M. M. & W.	1584
Iron hook nails, cs., 74	1584
Wichusich, Hilger & Co.	33
Ironware, cs., 5	33
Chains, cs., 36	36
Witte J. G. & Bro.	43
Mdse., cs., 43	43

Wire rods, bdis., 761.

Stobo Robert & Co.

Gun barrels, 60

Wapler Bros.

Cylinders, cs., 15

Williamson & Co.

Pig, tons, 300

Wood, Niebuhr & Co.

Wire, bdis., 770

Order.

Pig, tons, 683

Old rolls, tons, 302

Scheel, bdis., 248

Roda, pkgs., 16,000

Roda, bdis., 4151

Spiegel, tons, 500

Spiegel, kg., 405,731

First and axles, 233

Car wheels, 44

Coiled rods, bdis., 761

761

Gun barrels, 60

Cotton hoops, bdis., 405

Ore, tons, 2045

Steel.

Baring Bros. & Co.

Blooms, 560

Brown Wm.

Bundles, 226

Cases, 21

Roda, pkgs., 548

Collins G. E. & Co.

Blooms, 28

Carey & Moon.

Cases, 21

Drexel, Morgan & Co.

Blooms, 3835

Duval H. R.

Plates, 93

Plates, 124

Cases, 12

Bundles, 116

Bars, 16

Fraser & Co.

Cases, 5

Scott Thomas.

Bundles, 120

Temple & Lockwood.

Bundles, 120

Wagner W. F.

Bundles, 141

Bars, 46

Cases, 24

Plates, 74

Order.

Blooms, 3189

Cases, 22

Roda, rolls, 771

Roda, bdis., 1584

Bands, 174

Bundles, 414

Cases, 33

Wichusich, Hilger & Co.

Ironware, cs., 5

Chains, cs., 36

Witte J. G. & Bro.

EXPORTS.

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the week ending June 13, 1882:

Hamburg.

Valves, cs., 15

Mf. iron, pkgs., 15

Mach'y, pkgs., 37

Light rods, cs., 4

Wire gds., cs., 1

Met. gdt's, cs., 2

Nails, kegs., 11

Clocks, pkgs., 69

Hdw., pkgs., 104

Ag. imp. pkgs., 139

Pilm., gals., 794,707

Sew. ma., cs., 1,797

Guns, cs., 1

Mf. copper, cs., 50

Brass, cs., 202

Arms, case., 1

Stettin.

Pil., gals., 294,859

Pilm., gals., 147,226

Danzic.

Pilm., gals., 192,893

Stockholm.

Pilm., gals., 324,853

Teedstrand.

Pilm., gals., 88,471

Bremen.

Hdw., pkgs., 149

Pilm., gals., 1,135,547

Mf. iron, pkgs., 22

Mach'y, cs., 1

Gas burn'g, case., 1

W. mills, cs., 76

Ag. imp. pkgs., 125

Sew. ma., cs., 1

Helsingfors.

Pilm., gals., 115,915

Copenhagen.

Pilm., gals., 204,999

Amsterdam.

Ag. imp. pkgs., 2

Hdw., pkgs., 14

Pumps, pkgs., 18

Rotterdam.

Hdw., pkgs., 21

Ag. imp. pkgs., 7

Met. bath., 1

Sew. ma., cs., 41

Clocks, pkgs., 1

Pilm., gals., 195,984

London.

Clocks, pkgs., 67

Wrappers, cs., 33

Stampware, cs., 3

 Tacks, cs., 12 | 140 || Pumps, pkgs., 5 | 175 |
Cutlery, cs., 6	210
Mf. iron, pkgs., 6	712
Mf. iron, pkgs., 3	712
Mf. iron, pkgs., 3	712
Mach'y, pkgs., 3	750
Sew. ma., cs., 71	2,473

Glasgow.

Hdw., pkgs., 18

Ag. imp. pkgs., 95

Mf. iron, pkgs., 18

the general interests of the trade, and especially for holding their own in respect of the proposed new standard wire gauge, and in labor questions. The founders are poorly engaged, as regards heavy work, and are all heartily "going for" an order about to be issued by the Liverpool Corporation for 20,000 tons of large-sized water mains. For channel iron, hoops, strips, chain and cable iron there is a freer inquiry, but prices are very little changed. Of Staffordshire nail rods heavy sales are reported within the week. Some time ago the Belgians formed a syndicate for the regulation of prices, &c., in this branch, and they have since lost many orders in consequence of the conditions they sought to impose upon buyers. Messrs. Austin & Co., London, inform me that they hear of very few inquiries for iron rails, which are nominally about £5. 5/ or £5. 12/6 per ton. In the same way old rails are neglected at your cable rails. There are few inquiries from Philadelphia for July-September shipments, but the money offered does not meet the views of holders (mostly railway companies and other strong parties), and no fresh transactions are reported. Heavy wrought scrap is sluggish at £3 @ £3. 2/6, f. o. b., for clean lots. From Ham- burgh it is telegraphed that nothing is doing in old materials, while from France firms in this respect is chronicled. Several sales were made last week. At Sens 1315 tons of rails were recently disposed of, the Creusot offering 100f. per ton, and the Société de la Franche-Comté 97f. 97c. For castings, cushions and grease-boxes the offers ranged from 65f. to 66f. 66c. At the depot at Tours 470 tons of rails were offered, the Creusot tendering at 96f. 50c., and M. Lapeyre at 88f. The former company was also able to offer the highest price for 497 tons of rails and 192 tons of other material at Beillant, viz., 89f. 50c. for the rails, 86f. for wrought iron, and 65f. for castings. M. Lapeyre tendering at the rate of 75f. 70f. and 60f., respectively. The Forges de l'Aveyron have bought some old rails at Boreau for 93f., as compared with 87f. offered by the Creusot. The quotations in Paris range from 117f. 20c. to 120f. The demand for crucible steel is quiet, the best employed Sheffield houses being Jessops, Births, Sandersons, Hobsons, Wardlows and two or three others whose brands enjoy a good reputation in the United States, Canada and France. Bessemer is in fair request. Blooms are very dull on United States account, although there are rumors that you must have a quantity from us this season. I sell them purely nominal at £5 @ £5. 10/ per ton. Rail crop ends are £3, f. o. b., sales, &c., and old railway leafspring steel, £5. 5/ @ £5. 10/, with a better demand from your market. Steel rails are a little softer, the low prices having brought in sundry orders from home, Indian and other lines. Current figures are cited at £5 @ £5. 10/ for ordinary sections, but I do not feel at all certain that £4. 15/ or £4. 17/6 would not be taken by one or two pushing houses. Large lots in question. Last week the Belgian government placed orders for steel rails as under: John Cockerill Co., 11,500 tons at 149f. 20c.; Angleur Co., 5,500 tons, and the Angreco Co., 3,000 tons at 149f.; Thy-le-Bateau Co., 300 tons at 149f. and 300 tons at 150f. There were German offers at 167f. 10c. to 175f., equal to about 155f. at their works, but no English firms tendered. Tin plates do not stiffen in any material degree, and are still about 15/6 for ordinary coils.

Stocks are being slowly lessened and the make is smaller.

SCOTCH PIG IRON

has been steady since I last wrote, but there have been no important variations in prices, either as regards warrants or makers' iron. The most hopeful feature in connection with this class of crude iron is the large local consumption of No. 3, which fact is understood to have enabled makers to reduce their stocks to the extent of 3000 to 4000 tons. To the same cause is doubtless attributable the very light additions made to Connal's stores of late, last week's increase there having been about 800 tons only. Shipments are above last year's totals, the comparative increase to date having been 40,458 tons, on a total of 240,350 tons this year. The furnaces blowing number 109 (including 8 on hematites), as against 121 last year. The stock in Connal's stores is 637,085 tons, compared with 559,742 tons a year ago. Imports from Middlesboro' into Scotland are on a small scale, the difference in prices being too small to promote its sale. Writing from Glasgow, on May 24, when the market closed for the holidays, James Watson & Co. said: "Since Friday last the market has been comparatively quiet, no special feature of interest having occurred. The demand for makers' iron is still good, and prices are well sustained. The Middlesboro' ironmasters still adhere firmly to 43/6 as the quotation for No. 3, and second-hand parcels are changing hands at 43/3 per ton. On account of the Queen's birthday and Whitehouse holidays intervening, no market will be held between to-day and Tuesday next. On Monday last the market opened at 47/8 and declined to 47/4, closing at 47/4 1/2 per ton. Yesterday the price rallied from 47/4 to 47/7 1/2, closing at 47/5 1/2 per ton. To-day a fair business was done from 47/4 1/2 to 47/3, closing with buyers at the latter figure, sellers asking 47/3 1/2 per ton. The shipments last week were 12,122 tons, as compared with 9532 tons for the corresponding week of last year." We quote:

	No. 1.	No. 2.	No. 3.
G. M. B., at Glasgow	48/6	47/8	47/4
Clyde	48/6	47/8	47/4
Ciltess	48/6	47/8	47/4
Langloan	48/6	47/8	47/4
Bartholme	48/6	47/8	47/4
Summerlee	48/6	47/8	47/4
Calder	48/6	47/8	47/4
Carbroe	48/6	47/8	47/4
Glenarnock, at Ardrossan	48/6	47/8	47/4
Edinburgh	48/6	47/8	47/4
Dumellington	48/6	47/8	47/4
Shotts, at Leith	48/6	47/8	47/4
Kinnell, at Bo'ness	48/6	47/8	47/4
Carroll, at Greenmouth	48/6	47/8	47/4

John E. Swan & Bros., Limited, and William Colvin & Co. quote similar prices.

CLEVELAND PIG IRON

has gained somewhat in tone during the past week or so, and at date the quotations of the "bulls," or producers, than they have done for a long time past. Makers firmly adhere to 43/6 for No. 3, and the merchants have grown to regard 43/3 as a better level than 42/6 to 42/9. The local consumption is very good and shipments are quite up to the average—perhaps rather more. All the Northern works are busy except the heavy foundries, which are duller than for some years past. Makers' prices for G. M. B. net cash, f. o. b. at makers' wharves in the Tees, are:

No. 1	Foundry..	47/6	Mottled.....	42/
" 2	"	45/6	White	41/6
" 3	"	43/6	Refined Metal.....	62/6
" 4	"	43/	Kentledge.....	43/6
" 5	Forge.	42/6		

Bolckows last week sent off a cargo of 900 tons steel railway blooms from West Hartlepool to Baltimore. The Eaton Works have had a slight strike of mechanics, but the difficulty was only temporary and the works are well engaged.

WEST COAST HEMATITES

are quiet, and have not grown much firmer, notwithstanding the fact that most of the parcels lately pressed by second holders have been cleared off. Makers are endeavoring to proceed cautiously by declining to sell far ahead, and their policy in this respect is likely to be confirmed by the reported slight improvement in the rail trade, together with the probability of some of the furnaces in Scotland and Cleveland being taken off hematites and run on ordinary iron. Mixed lots may be quoted 52/6 @ 53/6, and makers' brands, for moderate lots, as under:

No. 1.	No. 2.	No. 3.
Cleator	54/	53/
Lonsdale	53/	52/
Workington	53/	52/
West Cumberland	53/	52/
Lowther	53/	52/
Moore Bay	53/	52/
Distington	53/	52/
Harrington	53/	52/
Solway	53/	52/
Maryport	53/	52/

Last week's shipments were 12,636 tons of hematite pigs and 7118 tons of rails and blooms.

BELGIAN IRON IN ENGLAND.

The Corporation of Birmingham have just given out specifications containing a singular condition—one which savors, indeed, of a certain amount of claptrap. The corporation needed a quantity of ironwork for certain new buildings they have in hand. Included in this were girders, joists, columns, &c. These articles, as you may possibly be aware, are largely used in this country, and latterly they have been almost exclusively supplied by the Belgian or Westphalian producers, who have laid themselves out for the trade, and send us rolled girders of lengths, &c., which our makers cannot, or all events do not, turn out. The Birmingham authorities specified that no Belgian iron must be supplied by the person or firm securing the contract to which I have alluded. This condition has been joyfully paraded as a proof of the superior wisdom of the Birmingham corporate sages, and hailed as a return to common sense. If any substantial objection could be urged against Belgian iron of this class I might be disposed to join in the chorus, but in the absence of any valid reason in that direction I am disposed to regard the step with suspicion. Birmingham is a Radical town and the seat of the English "caucus." Its civic rulers appear to be "playing to the gods" in this matter in order to extend their hold upon the masses, who are easily caught with chaff of this sort. What is most surprising is the direct violation of the Radical principle of buying in the

cheapest market, no matter where that market may be!

WAGES SLIDING SCALE.

In view of the extreme likelihood of a big dispute among your ironworkers being in existence when this reaches you, I append selected extracts with which I have been favored from the award (recently delivered) of Sir J. W. Pease, who was selected to arbitrate between the ironmasters of the North of England and their men, who had struck against the incidence of the sliding scale. The arbitrator wrote, *inter alia*: "I may perhaps be allowed to make a few observations consequent upon what has been laid before me. I do so, thinking it is almost necessary that those who are primarily affected by such an award should have before them the leading facts which have to be taken into consideration before it can be made. Just in proportion as the facts are understood, provided they have been rightly weighed by the arbitrator, will be the satisfaction with which his award will be received and acted upon. It was urged before me with considerable force by the operatives, that the sliding scale just suspended had not given satisfaction, as it dealt with the question of the value of their labor as if it always bore a certain fixed relative position to the price of iron; that contingencies in trade did arise, and that they had now arisen, when labor, being scarce in the market, was dearer, and should be purchased at a relatively higher price. They also alleged that neither did it follow necessarily that the other items in the cost of manufactured iron were subject to the same conditions as when the scale was arranged. They also averred that the employers, in their treatment of the labor question, had at times taken advantage of the state of that market to reduce the price of labor when it was redundant, without having that regard to the price of the article produced which is involved in adhering to guidance entirely to a sliding scale. It also appeared during the inquiry (and this supports such an argument) that certain allowances, under the name of 'prize money' and 'Monday working money,' which were freely given during times of scarcity in the labor market, were immediately withdrawn by certain employers as soon as the condition of the labor market enabled them to do so, without regard to the sliding scale. These items were so obviously items affecting the payment of labor, that during our sittings they were, by unanimous consent, admitted as payments, and placed under the control of your association for the future."

On the other hand, it was alleged by the employers that no better standard existed of the value of labor in the market than the price of the article produced, especially when, by mutual arrangement, the question of the value of labor was dealt with in so wholesale a manner as it is by such associations as yours—that the very fact of a sliding scale involved the acknowledgment of the principle—that as the article manufactured advanced in price by the action of the laws of supply and demand, so would the desire to create the profitable article occasion a greater demand for, and a consequent improved price for, the labor which produced it, and that thus the scale produced by its gradations the correct figure for the payment of the item of labor. That if even there was a temporary scarcity of labor, the fact of higher prices soon produced an abundant supply by the return of old hands into the trade, and the education of new ones. * * * It is impossible to eliminate from the consideration of the price to be paid to the operatives the price received by the employers for the article the operatives produce. Indeed, the most perfect form of co-operation of labor and capital that we can conceive must be primarily based upon such a consideration. The sliding scale, which, it was admitted, was eagerly welcomed by both parties in 1880, and which, the operatives allege, has broken down, appears to have given dissatisfaction to the operatives, not because the main principle was wrong, but because the details of the arrangement require further adjustment to fit them to times of an ultra-ordinary character. It is unfortunate, in some respects, that the ship plates form so large a portion of the articles on the sale price of which the item of wages is based. These are necessarily sold considerably in advance. The ship owner contracts for his vessel, the shipbuilder purchases the needful plates for a long forward delivery, and so, in a rising market, the selling price of the day, as in this instance, must be considerably above the deliveries on which wages have been based.

"It is evident that, as wages, almost necessarily, are based upon the experience of the past, anomalies are produced, sometimes in favor of the employers, sometimes of the operatives. These anomalies are most glaring when the market has fluctuated with rapidity; the shorter the periods between the ascertainment of prices and the settlement of wages the less will these anomalies be apparent. * * * The figures which have been admitted at various arbitrations show that taking 1/ in the £1 on the realized prices as the primary basis for wages, the sum paid in excess of that figure between the end of 1874 and the beginning of 1882 has varied between 0d., 1/ 1/3, 1/6 and 1/9 ton. There is but one exception to these figures during a period of seven years, during which the realized price varied between a maximum of £8. 14/3.0p to a minimum of £5. 3/3.12 ton. This exception was December 22, 1879, when the employers conceded 12 1/2 per cent. (or 1/3), making the figure 3/ above the 1/ in the £1 on the realized prices. This was done with a quickly rising market, and during the time of excitement caused by the great demand for iron from America, and conditional also on the acceptance of a two years' sliding scale, which was to place this figure at 1/6 in the £1 on the realized prices, for two years from May 1, 1880. Including this exception, the average paid over 1/ in the £1 on the realized prices over a period of seven years will be about 1/4 ton.

"I am aware that in 1868, 1869, 1870 and 1871, we had prices varying from £6. 5/ to £7. 2/ ton, with a rate for puddling varying from 1/9 to 2/6 above 1/ in the £1 on the realized prices. I am also well aware the price of manufactured iron advanced rapidly from the end of 1872 to the middle

of 1874, during the period of inflation which ultimately proved so prejudicial to both employers and operatives throughout the North of England, the price of iron being from £10. 5/ to £12 ton, and the margin above 1/ in the £1 on the realized prices was considerably above any previous or later figure, reaching 4/ ton; but these prices can have but little bearing on the £5. 10/ to £7 realized prices of this day. The conclusion, therefore, may be safely drawn that the principle of the sliding scale now in suspense has been the general rule of your decisions for the past seven years, and that arrangements and awards have only varied the 1/6 above the 1/ in the £1 on the realized prices, as settled by Mr. Dale on the 23d of April, 1880, from 0d. as a minimum to 1/9 as a maximum—Mr. Shaw Lefevre having during a period of depression practically fixed it at 1/."

The gist of all this is that the sliding scale can be successful and satisfactory should cover everything in the nature of wages, and should be based upon average selling prices frequently ascertained and rapidly adjusted.

ELECTRIC LIGHTING

continues to engross a great deal of public attention, particularly from that section of the British public which is interested in the shares of the numerous companies formed within the past month or two. Additional ventures of this class appear almost daily, and the shares are as eagerly taken up as ever. The aggregated capital of these concerns must now reach many millions sterling. Every leading system has its company, and some have many sub-companies formed for working the particular light in different parts of England and abroad. The parent company sells concessions to its progeny, and they in turn grant permits to their offspring, so that it is only a question of time for every hamlet in Great Britain and every foreign Grand Duchy to possess its own special company for each of the chief systems now in vogue. The Brush people seem to have worked out this idea most thoroughly, and the original company is said to have netted enormous profits thereby. Its shares (£10) stand at £48 @ £50, and the £4 shares at £23 @ £25. The Select Committee of Parliament, which has been in session on this subject, has at length recommended that the Board of Trade shall have power to grant licenses for the supply of electricity within defined areas; that local authorities shall be empowered, compulsorily, to purchase electric lighting undertakings at the expiry of 15 years, or at the end of any subsequent period of five years, at a fair market price, but without any addition in respect of compulsory purchase, good will, &c., and that overhead wires be prohibited, save with the consent of the local authority.

FOREIGN.

FRANCE.

(*Moniteur des Interests Matériels.*)

PARIS, May 28, 1892.—Metals.—The proximity of the warm season causes business to flag a little; metals have been only moderately active, and Copper and Tin a little lower. We quote, at the close: Copper, Chili Bars, 171.35 @ 173.75; Ingots and Slabs, 177.50; Best Selected, 180, and Pure Corcoro Ore, 174.50. Banca Tin, 267.50; Biliton, 266.75; Straits and Australian, 250, and English, 257; Lead, 35 @ 36, and Spelter, 44.50 @ 45. Iron.—The lower duties on Belgian and German iron have had no effect on prices in France so far, and some time will pass ere they will, for the demand for public works is such that the domestic product does not feel foreign competition. In the Ardennes there is no change; they quote Coke Merchant, 13.50 francs @ 100 kg. In the Loire-Marne, Merchant Coke, as firm at 21.50 francs being plentiful. Wire Nails, No. 15, are worth 29 @ 30. In the Loire and Rhone Basins, foundries, Steel works, machinists and most other makers are as active as they can be. The demand for Foundry Pig at Longwy in the Meurthe and Moselle districts remains brisk at 8.20 @ 8.40, while Pudding Pig is worth 7.20 @ 7.50 francs. As for the North, prices are fully sustained at Maubeuge on the base of 19 francs for Merchant, fixed at the late meeting; deliveries can only be effected slowly. They quote Merchant Iron, 20.50; T. Iron, 21 @ 24.50; Sheets, 23.50 @ 28.50, according to thickness. Some Paris workmen at the foundries, having attempted to inaugurate a strike, have been sent back to where they came from. At Paris, Charrier offers Merchant Iron at 19.50, and Flooring ditto at 20.50; Grenelle, nevertheless, still obtains 18 francs. The project of an elevated railway in this city, if carried out, will give considerable job to the local iron works. Coal is pretty much featureless at present; inland navigation, soon to be closed for the summer, is very active. Stocks in the Loire Basin are quite light.

BELGIUM.

(*Moniteur Industriel.*)

BRUSSELS, May 30, 1892.—Iron.—The market here has been better during the week; the improvement is nothing very great, yet the situation appears more hopeful. In finished iron some considerable dealings have taken place for export, enough to give work to several rolling mills while for a long time have not received any foreign orders. Corners and Beams, long neglected, are benefited thereby. English Pig has sold as low as 5.90 francs in this market; Domestic Pudding Pig is worth 5.50 @ 5.75. The Belgian iron is being sold at 12 francs, obtainable with a little bargaining, probably, at 12.50. Beams we may quote, 14.50 and Corners, 15. There is a pressing demand for Sheet Iron, so much so that at large orders have to be declined, because not to be filled unless considerable time be allowed the maker for delivery. As a general thing the really first-class iron works in Belgium have no reason to complain, being all fully and remuneratively engaged. There is a good, steady run of orders of which the better concerns are the chief recipients. Boiler Sheets can, without difficulty, be placed at 20 @ 21. At the recent Steel Rail adjudication the Angleur Company tendered 5500 tons at 140 francs; Serrant, 11,500 tons at 149.50, and 11,500 at 151.80; Ougree, 2000 at 140, and Thy-le-Chateau at 140. English makers, who have 15 francs charges besides the loss on exchange, did not tender any Rails, while the Germans were altogether too high, say 167.50 @ 175 francs. The average has been 140.10 francs, against 150.50 in August, 1881. Coal.—Considering that the iron industry is not very brisk just at present, Coal shows extraordinary liveliness, and in all grades, so that our Coal mines find no difficulty in placing their current output at remunerative rates, especially at Liege, where not one company can show an accumulation of stock. Usually, the briskness now witnessed does not come before August.

GERMANY.

(*Borsenhalle.*)

HAMBURG, May 30, 1892.—Iron.—We receive for the week the following from our Dortmund correspondent: "The tendency here still remains unsatisfactory, with the sole exception of Pig Iron, which gradually seems to gain in firmness, probably due to the projected curtailment of output. Puddling iron continues under a cloud, with great irregularity in prices. Even heavy Sheet Iron till now tolerably well sustained, has given way about 5 marks, yet even the present figure of 200 for second and 210 for prime quality is still quite remunerative to the maker. During the past few weeks a few steel rail orders have dropped in and more are looked forward to. These, however, only benefit a few concerns; the bulk of makers are finishing what work they had received. On the

other hand good commands are still received for hoop and car wheels. Our car and locomotive builders, the latter in part are still busy, but of bridge makers only a few have been favored with large orders lately; most of them for a year past, are sufficiently occupied. Foundries might be busier, but machinists and boiler makers are tolerably well engaged. Coal meanwhile continues dull; from July 1 next forward more is asked for futures, but I presume producers will be content if they can maintain current ones. The Bergmark Railroad is in treaty for its future supply. Metals cannot be called active, but they evince great stiffness. Lead is firm, English Pig at 16 @ 16.50; ditto Sheet, 16.50 @ 17; German Pig, 14.50 @ 15, and Spanish, 18 @ 18.40. Copper is held higher; we quote Drontheim, 73 @ 73 1/2; Electrolytic, 76 @ 77, and English Refined Ingots, 73 @ 74. Tin is sustained, we quote Banca and English, 128 @ 129; Australian, 126 @ 127. Spelter remains without anything doing, 17.25 @ 17.50 marks @ 50 kg.

(*Cologne Gazette.*)

DUSSELDORF, May 30, 1892.—Iron.—In this vicinity the tendency in Pig Iron gradually improves, but this is not the case with finished. Little change is reported from the Moselle and Sarre district; both Pig and Finished Iron sell with great ease. Luxembourg, it seems, is to have its first steel works. Metz & Co., of Elche, intend buying extensive iron mines at Dudelange, where they will erect four blast furnaces and a Thomas steel works. The Upper Silesian iron market still remains in good position, and Puddling Pig is quite stiff. Out of 55 coke blast furnaces 34 are blown in. Merchant iron continues to look up, and Sheets are very active at firm rates. Coal is dull there, except nut and small.

HOLLAND.

(*Koek & Vlierboom.*)

ROTTERDAM, May 31, 1892.—Tin.—Our market is excessively quiet at 99.25 guilders @ 50 kg. on the spot, and 99.75 to arrive, both nominally.

AUSTRIA.

(*Austrian Trade Journal.*)

VIENNA, May 28, 1892.—Iron.—The general situation has been subject to little change since our last report. There is not much probability that the demand for either Pig or finished will revive much before the middle of August next. In Bohemia, old rails and scrap sold to a considerable extent during the week, while in Hungary comparatively little transpired there. We quote to-day: Common Pig, 52 @ 53 florins @ ton at the furnaces; Gray ditto, 55 @ 56, and Bessemer, 58 @ 59; Merchant Iron, 115 @ 125; Bohemian, 110 @ 115; Sheets for locksmiths, 173 @ 185; ditto for roofing, 185 @ 195; ditto for boilers, 175 @ 185; ditto for tanks, 165 @ 170, and beams, 125 @ 135. The active demand for sheets continues unabated. Developments which are to grow out of the opening of the St. Gotthard tunnel and the greater activity in trade between Rhenish Westphalia and Northern Italy will be watched with great interest by the coal producers and the iron trade, &c., in Austria. Competition between the Mont Cenis, St. Gotthard and Brenner transit lines will be great eventually, leading, no doubt, to very low freight rates unless competing railroads come to an understanding among each other. At any rate great changes in the current of trade seem inevitable, and it is to be hoped that Austrian producers may not be the losers by it in the long run. During the week under review Metals have undergone no change. We therefore do not repeat the quotations given in our last, which remain unchanged.

EAST INDIES.

(*Hessener & Co.*)

COLOMBO, May 2, 1892.—Plymouth.—The market has been quiet; dealers are willing sellers at a reduction. We quote in rupees, @ ton: Fine Lump, 150 @ 160; Ordinary ditto, 135 @ 140; Chips @ 20; and 47.50 @ 52.50. Shipments from October 1 to April 27 have been, to the United Kingdom, 59,728 cwts.; to Trieste, 614; to India, 249; to Australia, 154; and to the United States, 64,202; together, 125,427 cwts., against 671 in 1891, 120,025 in 1890, and 53,000 in 1889. Exchange—Six months' sight, 1/8 13/16ths.

Artificial Fuel.

Newhaus & Heniger, of Berlin, have devised an apparatus which serves not only for the performance of the preliminary operations for the pressing of coal dust into the required shape for use as fuel, but can also be used by itself without being connected with the press, to bring the combustibles into a suitable form for facilitating the liberation of their gases. The chief operations required in the manufacture of artificial fuel consist in drying the combustible, in developing the tar contained in it, and, finally, in compressing the fuel. These are performed in heated and rarefied spaces in special apparatus. The contrivance of the above-named gentlemen is provided with a hopper, in which the combustible is placed after having been previously reduced to a finely divided state. This careful reduction is, of course, only necessary when it is intended to compress the material afterward into patent fuel, and can be dispensed with when the material is simply to be dried for the purpose of driving out the gases. The hopper opens, by means of a neck at the bottom, into a horizontal cylinder provided with double walls, which can be replaced by a double-walled trough, in which a worm is placed slightly below the center. By turning this worm, the pulverized material is driven from the closed end of the cylinder to the other end, which is open, and finally falls into a reservoir, which is also double-walled and is open at the bottom. The spaces formed by the double walls of the horizontal cylinder and reservoir, which are tightly closed all around, are in direct communication with each other by means of a connecting pipe. The heating of the apparatus is produced by introducing steam from the driving engine, thus drying the combustible contained in the horizontal cylinder and reservoir to a certain extent. Steam can also be taken from a boiler specially erected for this purpose. The long axis of the reservoir is placed nearly or quite vertical, in order that the material to be further acted upon may fall by its own weight into the drying space below. For this purpose the bottom attached to the inner wall of the reservoir is arranged so as to incline downward, and terminates in an open neck (capable of being closed by a slide valve), to which the outer wall is attached.

The part of the apparatus thus far described serves merely as a preliminary dryer. The special drying apparatus is arranged directly underneath it, and can be placed in communication with the preliminary drying apparatus by means of a movable funnel. Should it be desired to convey the material preliminarily dried into the special drying apparatus, this funnel is pushed in between the latter and the above-mentioned neck of the reservoir, and the slide valve is drawn back. The material then falls upon a second and lower slide, which closes the upper end of a vertical cylinder of the special drying apparatus. This cylinder is also provided with double walls. Steam taken in a boiler is driven through the tightly-closed case

formed by these double walls, being admitted and allowed to escape by means of two pipes placed at the upper and lower ends respectively. The interior of the vertical cylinder above the steam casing is in communication with a separate chamber by means of a special connecting pipe, in which the vapors constantly developed by the highly heated material in the vertical cylinder are immediately condensed. In addition to this, a partial vacuum is produced by which the mechanical emptying of the vertical cylinder is facilitated, and by means of which all the air which may possibly be contained in it is removed. The air pump provided for this purpose also serves to remove the steam from the vertical cylinder, and this, combined with the condensation, forms the special characteristics of the process. In order to ascertain whether the material is sufficiently dry to be compressed, a sort of hygrometer is attached to the connecting pipe of the condenser. A second pipe is placed at the side of this connecting pipe and leads to a pulley frame, in which an axle is placed, provided with a lever, to which a catgut is fastened. The other end of this catgut is attached to a screw on the outside of the communicating pipe, and which can be suitably set by means of a thumb-screw. The catgut can thus be easily stretched to the required extent. The end of the above-mentioned axle, which projects out of the pulley frame, is provided with a pointer and a suitably-placed spring, and the alternate contraction and expansion consequently acts on this spring, causing the pointer to change its position. After the material has been sufficiently dried and freed from air it is placed in a reservoir and subjected to pressure. A larger quantity of the combustible than the process can work should, of course, be supplied in order that the operation may not be brought to a standstill, and the drying reservoir is therefore usually not empty when fresh material is brought from the vertical cylinder.

The main advantages of the process are that the small coal is dried in a heated and rarefied space, and that the temperature is kept uniform during the drying process, notwithstanding the constant addition of new material and the consequent absorption of heat. The space allowed for the expansion of the vapors formed in the upper part of the condenser is, moreover, exceedingly small, because if this were not the case the action of the condenser and of the air pump would be impeded by the powerful expansion. The size of the drying apparatus, and also of the condenser and air pump connected therewith, is regulated by the quantity of the production in each case. The formation of tar can be effected while the fuel is in the drying cylinder, its principal development, however, taking place when the materials are worked for the purpose of making patent fuel in hot press molds, as a result of the pressure required to bring it into the desired shape. The tar is here the exclusive binding material of the mass by which its formation into fuel is rendered possible. A press of any already improved construction may be successfully employed, the chief condition being that the pressing takes place in a rarefied chamber in order that compact masses of fuel without air-spaces may be produced. The mass subjected to this treatment does not come into contact with the outer air until it is thrown out in the form of finished bricks. The fuel, as has been stated on previous occasions, has been used in many instances with highly satisfactory and economical results, and further improvements and developments in the different processes heretofore introduced will undoubtedly take place in the near future.

The Pernot Open Hearth Furnaces at the Cambria Iron and Steel Works.—The following account of the work of the Pernot furnaces, at Johnstown, will probably be of interest to our readers: After a stop of two weeks at the beginning of May, the furnaces were in active operation on the 22nd of that month, and for the week ending May 28th the product was 527.23 tons, with a loss of 4.14 per cent. For the week ending June 4th, the furnaces having been provided with new roofs, the output was 501.4 tons and loss 3.27 per cent. The largest output, 667 tons, loss 2.44 per cent., was obtained during the week ending June 11th, the record being as follows:

Furnaces	No. of heats.	Tonnage.	Average time of heats.	Total running time.	Aver. interval.
No. 1....	30	300.70	h. m.	d. h. m.	h. m.
No. 2....	26	376.30	5 21	3 9	37 1
Total	46	667	4 57	6 13	14 1

The quickest heat occupied exactly 4 hours and the longest one 6 hours 55 minutes. The first heat on furnace No. 1, after having been idle, was made in 31 hours 27 minutes.

A circular saw, 87 inches in diameter, and believed to be the largest of its kind yet made, has recently been turned out by a Sheffield firm. It is claimed, however, by another firm of the same place that they have manufactured several saws of 88 inches diameter. Considering the extreme difficulty of producing suitable plates of this size, the expense of the working appliances, &c., these saws are undoubtedly worthy of notice, and reflect credit upon the respective firms.

It is stated that a priest of Ravenna, Italy has constructed an electrical apparatus which can be set in operation by simply pressing a button, and by which the doors of a large building can be instantaneously opened. The apparatus has been tried and it is said, has given good results, and the inventor hopes to improve it in such a manner that, should a fire occur, the rise in temperature would cause it to operate.

A number of highly-productive petroleum wells have been struck in Germany, and it is anticipated that, at no distant time, further supplies will be discovered which will form the basis of a remunerative trade.

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The trade may be interested to know the history of the celebrated Griffin Scroll Saw Blades. About four years ago Mr. Griffin, an enterprising machinist in New Hampshire, became interested in scroll sawing. Having occasion to use the regular Paris saw blade, the idea occurred to him, "Why cannot I make a better blade?" He thought about it, and after nearly a year's experimenting he produced and patented the best scroll saw blade ever made.

Their popularity has grown each year, so that they now have a national reputation. At first the trade were slow to take hold of the Griffin blades, but they soon saw that they must keep them, as the boys always called for the Griffin blades, and wouldn't take any other kind. Very few of the foreign blades are now imported into this country. Already we are now exporting the Griffin blades to Europe. The following letter (and we have received thousands of the same character) will explain why these Griffin blades are so popular:

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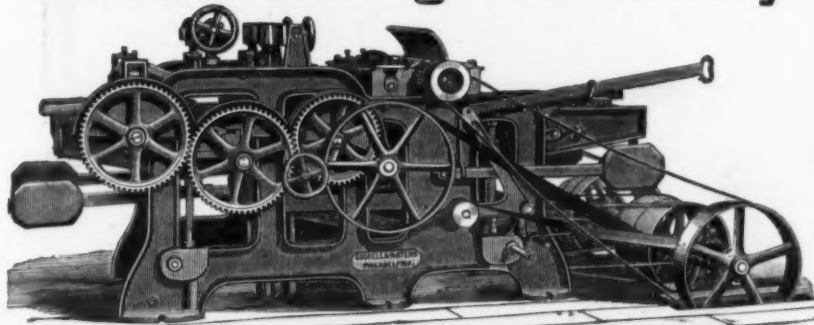
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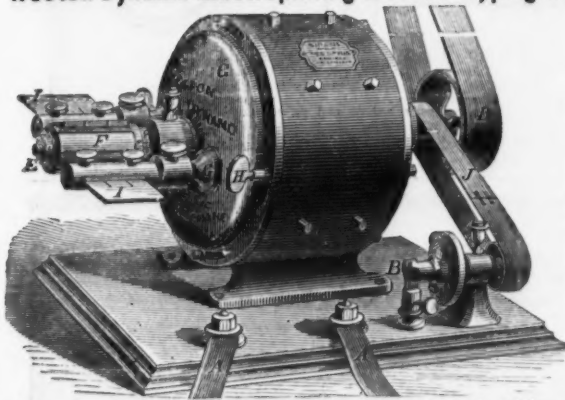
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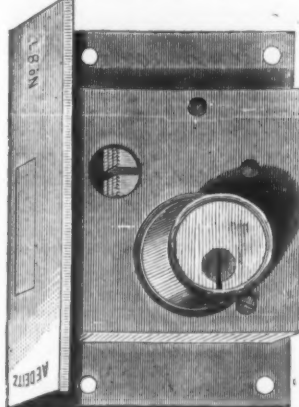
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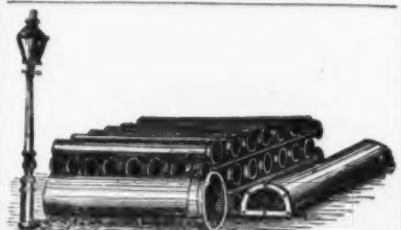
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GREEN RIVER TIRE UPSETTERS.

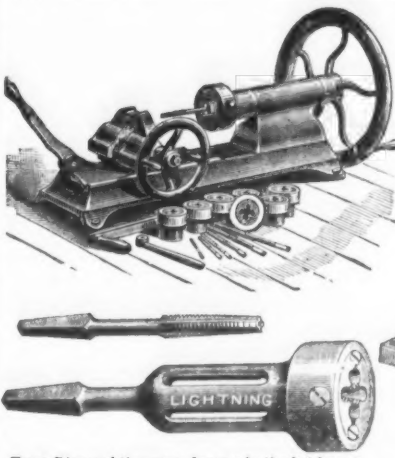
GREEN RIVER TIRE BENDERS.

Green River blacksmith's Vises for welding heel and toe calks.

Tire Measuring Wheels, Tire Nut Wrenches for removing nuts inside of felloes, used in bit stock.

Special Screw Drivers for Machinists, Model-Makers, Blacksmiths, Wheelwrights and Amateurs.

SEND FOR ILLUSTRATED PRICE LIST.



Taps, Dies and reamers for use in the bit stock.

The Celebrated "LIGHTNING" Screw Plates.

THE 1882 PENNSYLVANIA LAWN MOWER

Outstrips All Competitors. Premiums Taken Over All Other Mowers.

Every Machine Warranted to Work as Represented.



ALSO MANUFACTURE THE

Best 10-Inch Forward Cut Lawn Mower in the Market, named "Quaker City."

For descriptive catalogue and prices write to

LLOYD, SUPPLEE & WALTON, Philadelphia.

DURRIE & McCARTY, New York.

AMES FLOW CO., Boston, Mass.

FRATT & CO., Buffalo, N. Y.

SIMMONS HARDWARE CO., St. Louis, Mo.

HAMILTON & MATTHEWS, Rochester, N. Y.

MARKLEY, ALLING & CO., Chicago, Ill.

HUNTINGTON, HOPKINS & CO.,

Sacramento & San Francisco, Cal.

H. MITHOFF & CO., Columbus, Ohio.

CULTER, HOLDREGE & CO., Peoria, Ill.

DUCHARME, FLETCHER & CO., Detroit, Mich.

LOCKWOOD, VANDORN & TAYLOR, Cleveland.

ANDERSON HARDWARE CO., Indianapolis, Ind.

WM. FRANKFURTH & CO., Milwaukee, Wis.

WALTER S. LUDLOW, Cincinnati, Ohio.

LLOYD & CLARKE, La Crosse, Wis.

T. M. CLARKE & CO., Atlanta, Ga.

A. E. BONESTEELE, Troy, N. Y.

Sacramento & San Francisco, Cal.

H. MITHOFF & CO., Columbus, Ohio.

CARBON POINTS FOR ELECTRIC LAMPS, AND PLATES FOR BATTERIES

We make a superior carbon for electric lamps; straight, burning with a clear white light, and of the greatest possible durability.

Send for samples and price list.

BOULTON CARBON CO.,

CLEVELAND, OHIO.

PERFORATED SHEET METALS,

FOR ALL USES



Light or heavy work in Iron, Steel, Brass or Tin Plates.

Perforated Zinc and Sheet Iron, for

Malt Kiln Floors, Grain Dryers, Bunt

Mill Jackets, Thrashers, Separators, Corn

Shellers, and all kinds of Grain Cleaning

Machinery; also for Mining and Concentrating

Works, Coal, Coke and Ore

Screens, Gas and Water Works, Paper,

Woolen and Flour Mills, Filters, Strainers,

Ventilators, etc. PERFORATED

TIN AND BRASS of all sizes. Iron, Steel,

Copper, Brass and Zinc Punched to any

size required. Special Attention

given to Work for Railroads and

Car-Builders. Special discounts to

the trade. Correspondence solicited.

Harrington & Oglesby Co.,

Nos. 43, 45 & 47 South Jefferson St.,

CHICAGO, ILL.

PHILADELPHIA SCREW CO., Limited,
Twelfth and Buttonwood Streets, PHILADELPHIA.

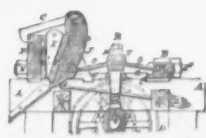
Manufacturers of

IRON & BRASS WOOD SCREWS.

Quality, finish and tests as to strength guaranteed equal to any in the market.

With improved facilities and largely increased capacity for production, we can fill orders promptly, and invite inquiries for discounts. A full line in stock.

BLAKE CRUSHER CO.,
New Haven Conn.



BLAKE'S
Challenge Rock Breakers.

Patented Nov. 18, 1879.

See The Iron Age first issue of the month.

WILCOX & HOWE, Birmingham, Ct.,
Carriage Hardware.

(See The Iron Age first issue of each month.)

The Swedish Iron Market.—According to recent reports it appears that the iron trade in Sweden presents but few interesting features, the market being quiet and dull, and few sales transpiring in the various departments. The supply is said to be too great and a reduction of the manufacture appears to be in urgent demand. Within late years India has become a large consumer of Swedish iron, the amounts shipped during the years 1878, 1879 and 1880 being 19,680 10,273 and 10,312 tons respectively. Although the shipments during 1880 only slightly exceeded those of the previous year, the difference will appear important when the considerable increase in the price during the latter year are taken into consideration. Iron says that as an improved feature in the Indian market as regards Swedish iron, it may be stated that buyers have of late shown less disinclination to purchase rolled iron, which class of iron they have for years entertained a strong prejudice against purchasing. Formerly, it appears, no certificate of whatever nature would convince the buyer that iron offered for sale was really of Swedish manufacture without the dents on the bars from the hammer being visible, and, in consequence, only forged iron was saleable, all other kinds, as for instance rolled iron, being believed to be of German, Belgian or English manufacture. A difference, but which is only believed to be transitory, is, however, still maintained in the price of these two kinds of iron, but buyers are clearly beginning to understand that there is really no difference whatever in their quality.

The Iron and Metal Exchange.—At a meeting of the Board of Managers of the Iron and Metal Exchange, on Saturday, the following standing committees were appointed: Executive—Messrs. Delafield, White, Flynn. Finance—Messrs. Mayer, Gerry, Leman. Complaint—Messrs. Hill, Snow, Rogers. Floor—Messrs. Rogers, Leman, White. Information—Messrs. Mayer, Hill, Shriver. Statistics—Messrs. J. A. Flynn, Mendel. Warehouse—Messrs. Robinson, Leman, Gerry, Delafield. Trade—Messrs. Leman, Mayer, John E. White, Libbald, Marval. Mr. E. J. Shriver was appointed secretary and acting superintendent.

An exchange states that St. Isaac's, the great cathedral at St. Petersburg, which was finished in 1859 and cost some \$25,000,000, is slowly sinking into the ground, and the authorities do not know how to stop it. The Russian capital is built upon a marsh, and the site of St. Isaac's is on one of its softest parts. Over \$1,000,000 was spent in driving piles originally, but the building has never been firm, and now threatens to topple over at one corner. A recent examination showed that on one side the columns had separated from the architrave, leaving a space of 3 inches between. The roof was at once lightened by removing large stones, but new fissures appeared as the work went on, the workmen left in fear, and the engineers gave up the job as a bad one. Since then nothing has been done except to hold consultations and reject unpractical plans for saving the building.

We have on hand and for sale at Elizabethport, N. J., the well-known
"READING" FOUNDRY IRON,
 both Nos. 1 Ex. and 2 Ex., in lots to suit the purchaser.

The No. 1 Ex. is peculiarly fluid, and will give a good strong casting when used alone, or will work well with a large percentage of scrap; and is suitable equally for stove work, light machinery or special castings.

The No. 2 Ex. is graded higher than is common with No. 2 Irons, and will be found suitable for machinery and other castings without mixing.

ALSO

THE COLEBROOK FURNACES
"GREY FORGE" and
"MOTTLED" IRONS.
 IN LARGE OR SMALL LOTS.

We shall be glad to receive your inquiries when you are in the market.

Respectfully yours,

PANCOAST & ROGERS,
 23 Platt St., New York.

NOTICE.

To the Hardware Trade,
Wholesale and Retail.

Before buying, send to me for quotations. Will give special figures lower than market rates on a large line of Shelf Hardware and Tinware. Have also an immense stock of special job lots in which I can give decided bargains.

A. W. WHEELER,
 141 Lake Street, CHICAGO.

UNION BOLT AND NUT WORKS.
THOMAS PARKES,

MANUFACTURERS OF
MACHINE BOLTS, NUTS AND RIVETS
 OF ALL KINDS.

Office and Works,
 204, 206 & 208 Chicago St., BUFFALO, N. Y.

WILLIAMS, WHITE & CO.,
 MOLINE, ILLINOIS.

DROPHAMMERS,
 HORIZONTAL PRESSES FOR BENDING IRON,
 GANG BORING MACHINES, TOOLS FOR PLOW MAKERS,
 THE JUSTICE HAMMER.

Send for Circulars.

SPECIAL NOTICE.

Having recently increased our facilities, we beg leave to call your attention to the fact that we are now prepared to do all kinds of general Machine Work, both light and heavy, making

REPAIRS TO CORLISS AND OTHER STEAM ENGINES
 A SPECIALTY.

WE REBORE CYLINDERS.

in their present position, from 3 to 110 inches; also, all makes and sizes of
STEAM HAMMERS AND BLOWING ENGINES,
 Both Steam and Blowing Cylinders.

Employing none but the best of help in our business, we can confidently assure our customers that their interests will be promptly and faithfully attended to.

WE MANUFACTURE A PATENT SPRING PISTON PACKING,

which has been in use for some 13 years past, giving the best satisfaction. We make and furnish the Elliptic Spring when desired. Customers having Cylinders Rebores, who desire new Pistons or Piston-Rings, would do well to send direct to us. We send competent men to take dimensions and make Pistons just prior to boring, so that they can be put in when the boring is done, saving in this way considerable valuable time. We have on hand 80 different sizes of PISTON-RINGS and PISTON-HEAD PATTERNS. Also, ALL SIZES OF CORLISS VALVE PATTERNS. All work guaranteed. Illustrated circulars sent on application.

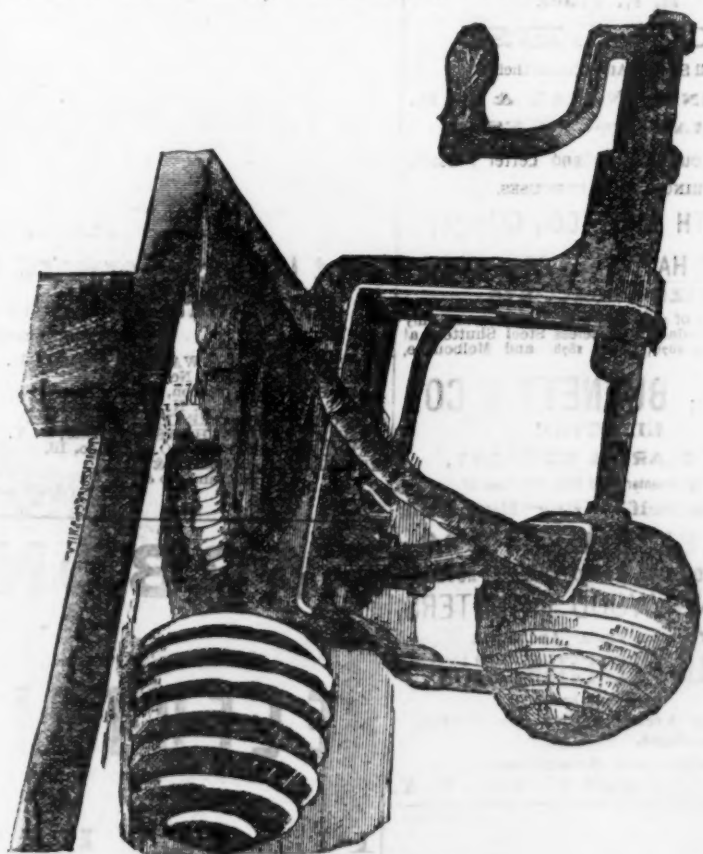
THE L. B. FLANDERS MACHINE WORKS,

1025 Hamilton Street, PHILADELPHIA, PA.

D. W. FREDRICK.

H. C. AYER.

PENN HARDWARE CO.'S "IMPROVED PENN" 1882
APPLE PARER, CORER AND SLICER.



Patented April 14th, 1882.

Far Ahead of Any Apple Paring Machine now Made.

You can with ONE HAND pare, core and slice an Apple and withdraw the Fork from the core all ready for another Apple. This is what no other MACHINE will do. Requires but one hand to work it. Does the work quicker and better than any other Machine.

MANUFACTURED BY THE

PENN HARDWARE COMPANY, READING, PA.



Our specialty. Also, Castings, Finales and Vases, Stable Fixtures, Hitching Posts, Door and Window Guards, Wrought-Iron Gratings, Fire Escapes and Ladders, Jails, &c. Our Fencing can be shipped to any part of the United States, and can be set up by the purchaser at small expense. Our prices are reasonable. Correspondence and notice of public listings of ironwork solicited. Every Hardware Dealer should have our Catalogue. Address
CLEVELAND WROUGHT IRON FENCE WORKS.
 Office, 21 Water Street, near Union Depot, CLEVELAND, OHIO.

E. C. ATKINS & CO.



SPECIALTY:
 LARGE CIRCULAR SAWS.

SOLE MANUFACTURERS
 OF THE GENUINE
 SILVER STEEL DIAMOND CUT SAW

INDIANAPOLIS, IND.

ANDOVER CHILL IRON for Car-wheels, Chilled Rolls, &c. Each pig of this iron is marked exact chill depth, 1/2 inch to 3/4 inch, and so guaranteed. Standard A. Whitney & Sons' Chill Cup. ANDOVER GRAY FORGE FOR BEST MILL PRODUCTS. F. A. COMLEY, Secretary and Treasurer. J. WESLEY PULLMAN, Agent. Office and Selling Agency, 497 Walnut street, Philadelphia.

THE "EDDY" STRAIGHTWAY VALVES.
 ALSO,
 FIRE HYDRANTS,
 Aze, Hatchet, Powder and
 Brush Machinery.

THE EDDY VALVE COMPANY,

WATERFORD, N. Y.

BENTON, FAULKNER & BIRD, N. Y. Agents

O. H. & W. H. MIDDLETON, Phila. Agents.

H. E. SMITH MACHINE CO.
 925 MARKET ST.
 PHILADELPHIA
 CELEBRATED
WOOD WORKING
MACHINERY

For Car Shops, Planing Mills, &c.

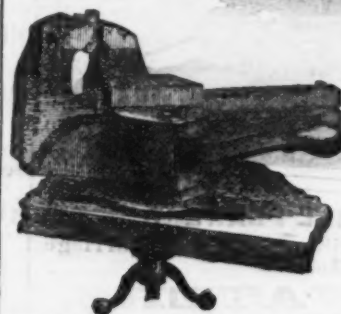
Also Machinery for all purposes. Correspond with us

FROM THE

London Iron Trade Exchange,

SATURDAY, MAY 20, 1882.

"We have received from Messrs. Merchant & Co., of Philadelphia, a well-known house in the tin plate and metal trades, a copy of a list of makers' brands of tin plates which they have just issued for the guidance of buyers. The brands are alphabetically arranged under the heads of "charcoal" and "coke," and all private brands and those supplied by makers to one customer only, have been carefully excluded. The result is that the list contains only those brands whose makers are known, so that any defect in quality or packing can be traced to the proper works, and the brand would naturally be avoided in future. Mr. Clarke Merchant was over here a few months since, and devoted much time to the compilation of the information contained in the list which has now been issued by his firm. Knowing what an outcry there has been in the States against the private brand system, we feel sure the outcome of Mr. Merchant's visit will be much appreciated by buyers of tin plates in America."



STEPHENS
PATENT VISE.

The most durable, and the only solid quick-working Vise, with automatic taper jaw attachment.

Will very soon pay for itself, in saving of time and labor.

For sale by the trade.

OFFICE:

41 Dey St., New York, U. S. A.

The Humane Calf Weaner



The Perfect Hog Ring and Stock Mark.

One instrument does for both purposes. The only Ring that injures the joint outside and makes a lock joint. The Humane Calf Weaner is as easy on a calf's head as a halter and as sure to stay. Samples and descriptive circulars furnished.

J. H. BROWN & CO., Mfrs. Hardware Specialties,
 OTTAWA, ILL.

NOTICE.

Gentlemen:

We refer you to our advertisement in the issue of June 8th. There will only be two more like it, one July 6th and one August 3d, for the Sheet Iron business will not stand any such expense long, as you know; therefore, look at them carefully, pick out the kinds of Hods and Shovels you want and forward your order before they are all gone. We have a large stock now and can fill all orders promptly, but if the strike lasts it will be impossible to get iron at any price; therefore send on your orders early, for those that come first will be first served.

IRON CLAD MFG. CO.,

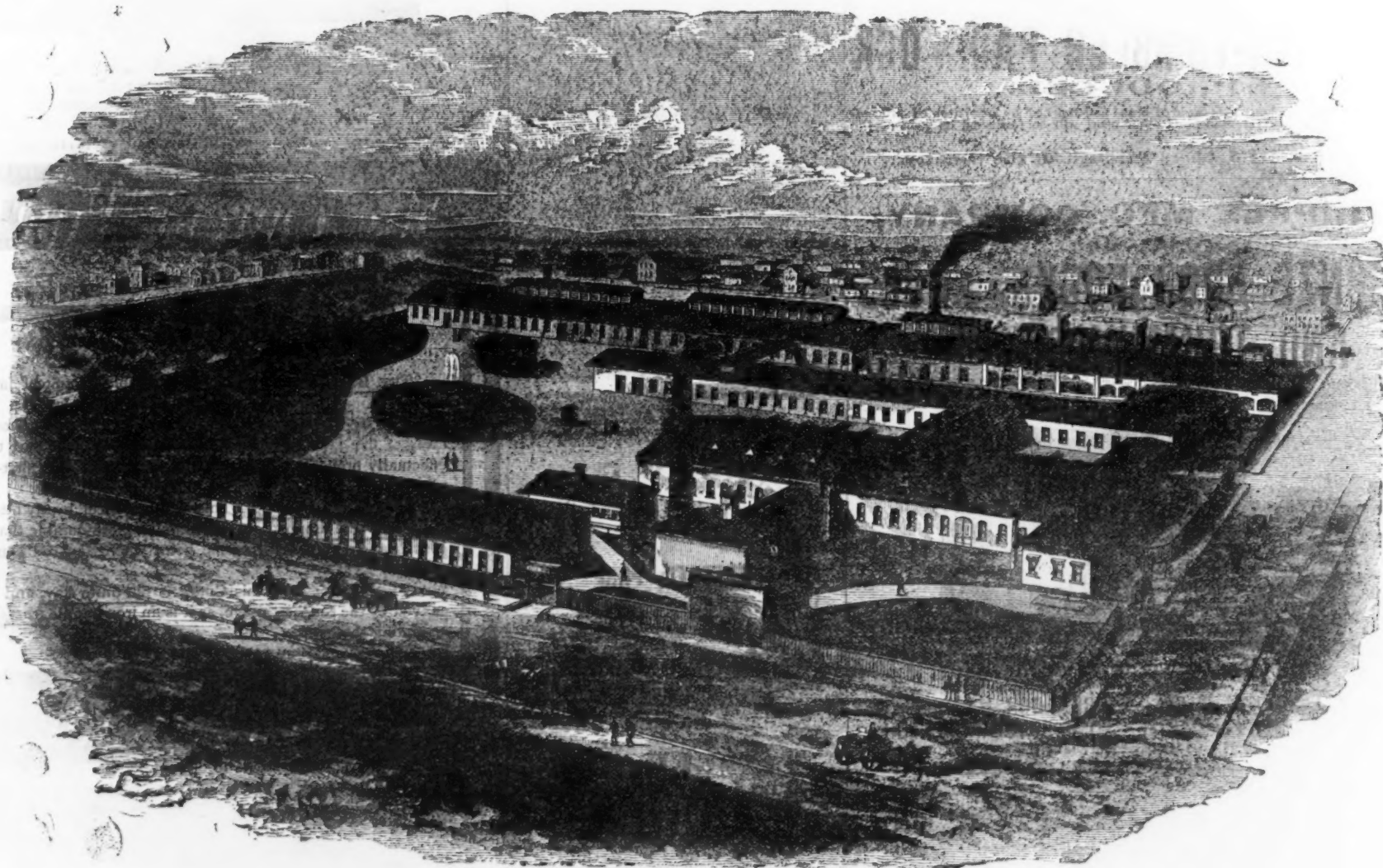
22 Cliff Street, NEW YORK.

NEW AMERICAN FILE CO.,

PAWTUCKET, R. I.

MANUFACTURERS OF

FILES AND RASPS.



1882.

PERUSE. PONDER. PURCHASE. PROFIT.

(Read the two issues next preceding.)

After four months' **TRIAL** of the **COMPARATIVE** worth of their own and several leading Brands of Files [**MILLS AND FLATS**,] the above Company are **HAPPY** to say said tests have resulted in **PROVING** their Files **SUPERIOR** by from **TEN** to **FIFTY** per cent. Not that every File is **SUPERIOR** to anything that is **MADE**, but the Tests by **MACHINERY**, "which are void of prejudice," **SHOW THEIR FILES** to be uniformly worth from Ten to **FIFTY** per cent. **MORE** than other Brands of Files in the **MARKET**.

The **EXPERIENCE** of years in the advantage of every **FACILITY**, the employment of the **BEST MATERIAL**, "they use nothing but the best **CRUCIBLE CAST STEEL**,"—"no Open Hearth"—the constant **TESTING** of the comparative worth of their own with other Brands, the **ENDEAVOR TO BE AHEAD**, the not being satisfied with "**GOOD ENOUGH**," the employment of the first and **BEST MACHINE** for cutting good Files ("Bernot,") and one which they claim **HAS BEEN INFRINGED** by about every machine **ADOPTED** for cutting files, all combine to make as they **JUSTLY CLAIM**, the **BEST FILE** in the market, and worth certainly Ten per cent. more **TO ANY CONSUMER**.

AXIOM.—**QUALITY** will win.

SEE NEXT ISSUE.

THE
EAGLE LOCK CO.,
TERRYVILLE, CONN.,
MAKE



(No. 4005.)

**THE ONLY PIN-TUMBLER PAD LOCK
EVER PRODUCED.**

It is self-locking and perfectly secure. It is made of brass and finished by our patented process. The above cut represents the only size yet made, but other sizes will be furnished as soon as the requirements of the trade are known.

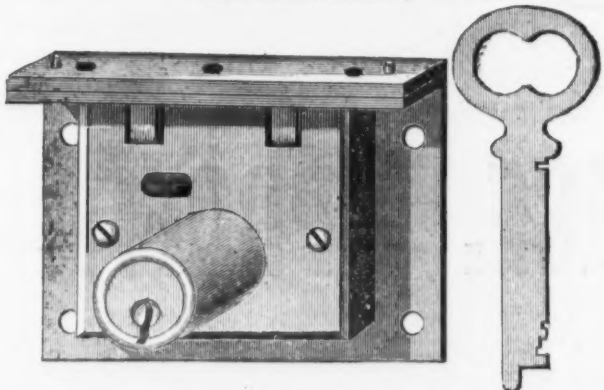
For Sale by Hardware Jobbers Throughout the Country.

THE WHIPPLE MFG. COMPANY,
CLEVELAND, OHIO,
**FINE BRONZE DOOR LOCKS, KNOBS
AND TRIMMINGS.**



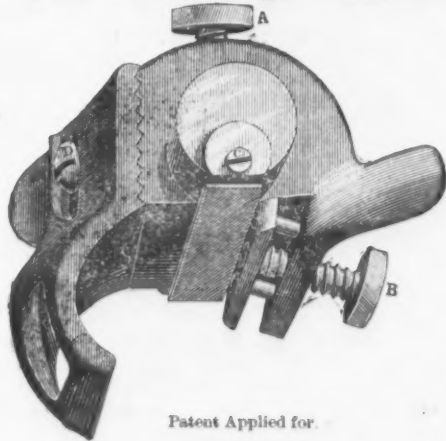
REAL BRONZE BUTTS, STORE DOOR HANDLES with
ORNAMENTAL BRONZE FRONT LOCK AND LATCH,
And a general line of
BUILDERS' HARDWARE.

THE CHARLES PARKER CO.,
MERIDEN, CONN.,



MANUFACTURERS OF CABINET LOCKS.

The "Challenge" Lawn Mower Sharpener.



Patent Applied for.

A NEW and much needed article,
and adjustable to any Lawn
Mower made.

**SIMPLE AND RELIABLE!
CHEAP AND DURABLE!**

Per doz. \$12.00. Discount to the Trade.

EVERY DEALER SHOULD HAVE THEM
IN STOCK.

For Sale by the Trade Generally.
THE CHALLENGE MFG. CO.,
PLAINFIELD, N. J.

HORACE F. SISE, Agent, 100 Chambers St., N. Y.

ALL MAKES OF
BARBED FENCE WIRE,
Stretchers, Diggers, Staples, &c. And
LOWE'S METALLIC PAINT,
The Great Railroad Paint.

CHARLES E. MCBRIDE, Eastern Agent, 197 Pearl Street, New York.
Also, Boston, Philadelphia and Baltimore.

John T. Lewis & Bros.
No. 231 South Front St.,
PHILADELPHIA.



Pure White Lead, Red Lead, Litharge,
Orange Mineral, Linseed Oil,
AND PAINTERS' COLORS.
Brooklyn White Lead Co.



White Lead, Red Lead & Litharge.
No. 182 Front Street,
NEW YORK.

JOHN JEWETT & SONS,
Manufacturers of the well-known brand of
WHITE LEAD.



TRADE MARK
ALSO MANUFACTURERS OF
LINSEED OIL.
181 Front Street, NEW YORK.



**The Atlantic White Lead and
Linseed Oil Co.,**
Manufacturers of
White Lead (Atlantic), Red Lead, Lith-
arge, Glass Makers' Litharge and
Orange Mineral;
LINSEED OIL,
Raw, Refined and Boiled.
ROBERT COLCATE & CO.,
257 Pearl St., NEW YORK.

SALEM LEAD COMPANY,
CORRODERS AND MANUFACTURERS OF
PURE WHITE LEAD.



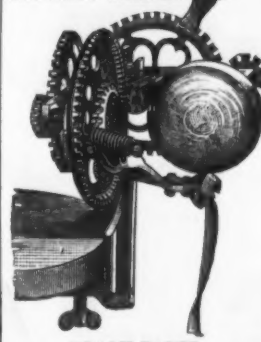
ALSO MANUFACTURERS OF
Lead Pipe and Narrow Sheet Lead.
F. A. BROWN, Treas. SALEM, MASS.



**LEVER
Lemon Squeezer,**
With perforated strainer. It
will squeeze one-third more
juice from a lemon than any
other, also quicker.
R. Onderdonk.

SCOTT MANUFACTURING CO.,
BALTIMORE, MD.,
SOLE PATENTEES AND MANUFACTURERS.

ROTARY KNIFE.



PEACH PARER.

The drawing out of the revol-
ving knife is the only known prin-
ciple for a machine to pare peach-
es successfully. The Machine has
little in common with ordinary
parers.

THE

**ONLY PEACH
PARER.**

THE

**BEST APPLE
PARER.**

GOLD MEDAL.



APPLE PARER.

Enlarged and improved. Is the
only successful Parer with a quick
return movement of the knife. All
the wheels have square holes and
shafts with square ends, so they can-
not work loose.



UNIVERSAL CAN OPENER.

SOLID CAST-STEEL SHANK AND KNIFE.

Adjustable to cans of any shape and size. Also,

Patent Tea Assorting Machines } For Packers Use
Patent Peach Pitting Machines }
Also Manufacturers of Medallion and Victoria Egg Beaters.

The "Eureka" Pipe Cutter



THE BODY—is fitted with an adjustable Cast-Steel Jaw at the point
where it comes in contact with the Pipe, which Jaw can be renewed at
any time by simply removing one screw. By this system the wearing
away of the Jaw (which in other cutters is the first part to give out) is
effectually prevented, and this tool can be kept in first-class order at
all times.

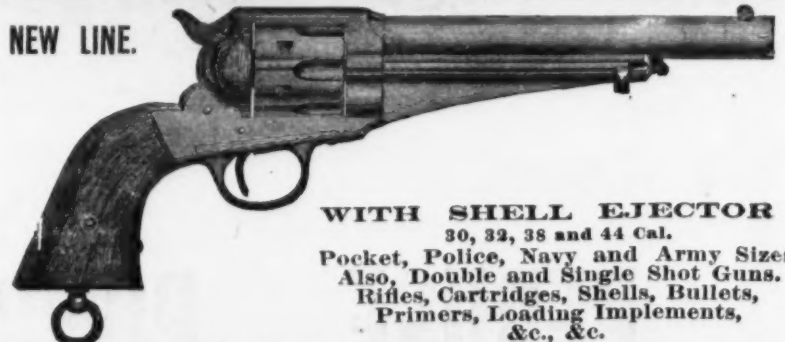
THE WHEEL BLOCK.—This is also of Steel, neatly fitted to its socket
and cannot be dropped out. It is much more durable than the cast-iron
blocks and is hardened at the point where the rod comes in contact
with it.

THE HANDLE—of this Cutter is put on to stay, and cannot be re-
moved by the roughest usage, as it is an iron handle, cast fast to the Rod,
operating the block.

—MANUFACTURED BY—

Pancoast & Maule } 243 & 245
SOUTH THIRD
STREET
PHILADA.

NEW LINE.



WITH SHELL EJECTOR

30, 32, 38 and 44 Cal.

Pocket, Police, Navy and Army Sizes.
Also, Double and Single Shot Guns.
Rifles, Cartridges, Shells, Bullets,
Primers, Loading Implements,
&c., &c.

Send for reduced catalogue and discounts of goods manufactured by
E. REMINGTON & SONS,
283 Broadway, NEW YORK.
ACME TOBACCO CUTTER, No. 10.

MANUFACTURED BY



F. F. ADAMS & CO., Limited
ERIE, PA.

**GREATEST ROCK BREAKER
ON EARTH.**

CAPACITY { A TON A MINUTE.
DON'T FORGET IT
Guaranteed to do Double the Work of
any other or Money Refunded.

SEND FOR CIRCULARS.

ALSO,

Engines, Boilers, Stamp Mills and
Mining Machinery.

**GATES & SCOVILLE
IRON WORKS.**

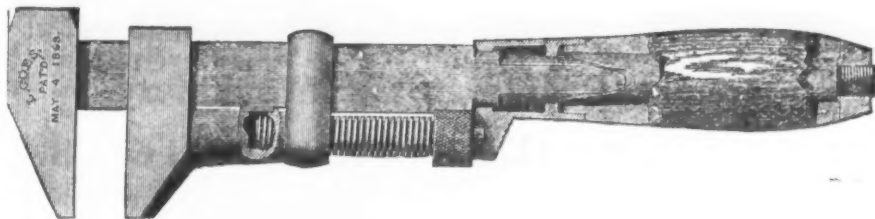
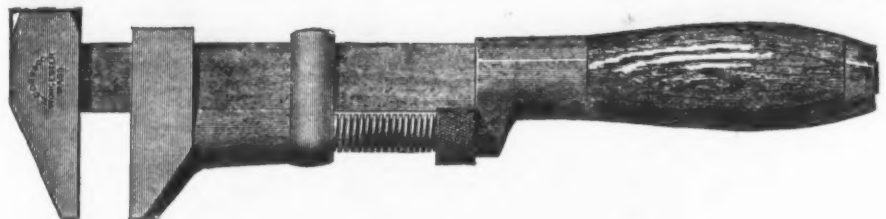
52 Canal St., Chicago.

L. COES & CO.,

MANUFACTURERS OF THE

ORIGINAL GENUINE IMPROVED PATENT SCREW WRENCHES.

ESTABLISHED 1839.



We discarded the old Nut attachment nearly two years ago and applied the better device we are now using (covered by patent) for preventing the back thrust of the ferrule. The superiority of this invention over all others has been fully established by practical test. By reference to above cut (sectional view) our improved method will be readily understood.

We make the shank of our wrench about **double** the size of those in other screw wrenches, leaving it **full size**, and **strength** by **not** cutting a thread.

Our Ferrules are made with **two** bearings, **both** fitting the shank.

An Iron Tube of sufficient strength to resist **any** pressure that may be put upon it, is fitted to the shank, one end resting against the lower bearing in the ferrule, the other against the enlarged **Tip** or **Nut** at end of handle, all **rigidly** held in position, the wooden handle made to fit exactly over the Iron Tube, forming a **solid** combination of Wood and Iron, preventing any possible displacement of the ferrule from hard usage. All our Wrenches are made with **straight Bar**, full size, the **extreme length**. The Jaw is made with **ribs** on the **inside**, running full length of the Jaw, which, in connection with the projecting sides, both secured by patent, are fully equal to any strain the Bar may be subjected to. We have also enlarged the barrel of the Jaw to take a **larger** and **longer** screw, enabling our Wrench to accommodate a larger Nut than any other manufactured. We make our goods of the very best material, thoroughly case-harden, and warrant every Wrench.

Manufactory at **WORCESTER, MASS.** Warehouse, 97 Chambers and 81 Reade Streets, **NEW YORK.**

DURRIE & McCARTY, Sole Agents.

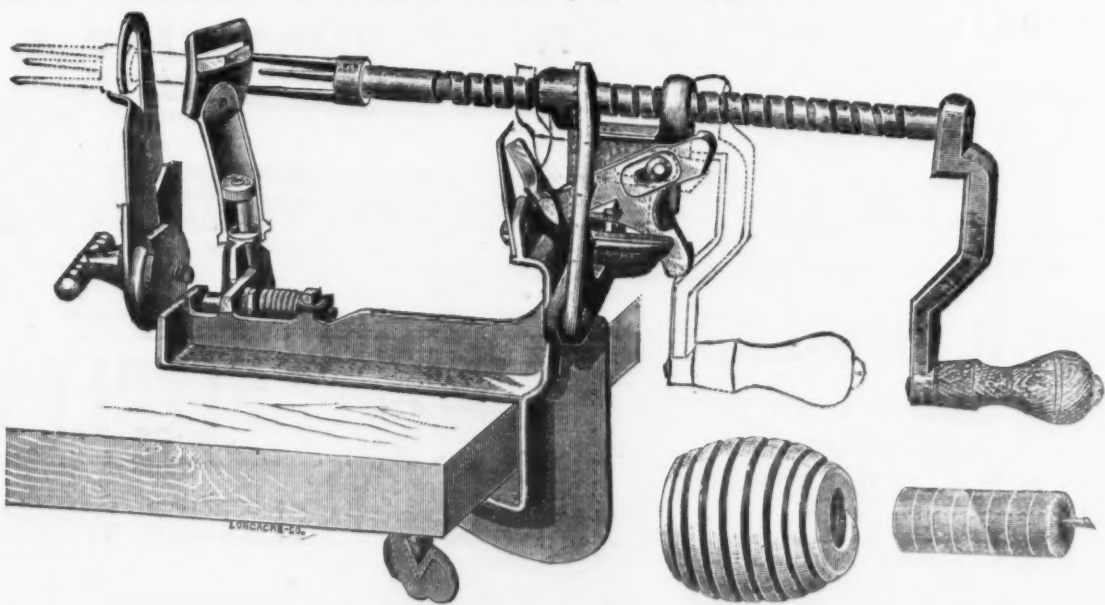
ADVANCE

APPLE PARER, CORER, AND SLICER

OF 1882.

Patented October 19, 1875, and Patents Pending.

The Only Machine ever Invented that will Entirely Pare, Core, and Slice an Apple.



With one hand you can Pare, Core and Slice an Apple and withdraw the Fork from the Core.

MANUFACTURED BY THE

READING HARDWARE CO., READING, PA.

Wyoming Shovel Works,

WYOMING, LUZERNE COUNTY, PA.

Patent Plain Back Solid Shovels and Spades, Back Strap Shovels, Spades and Scoops.

RAILROAD AND MINERS' SHOVELS of Superior Quality a Specialty.

Send for Price List, &c.

PAYNE PETTEBONE & SON.



John Waldron,

Manufacturer of

Sprout's Double and

Single Shear

Horse Hay Forks

And

Sprout's

HAY ELEVATORS,

PULLEYS and

GRAPPLES.

Send for Circulars.

Mussey, Lycoming Co., Pa.

REKAERB ECI YESAERC

IN USE BY

Meat & Fish

Packers,

ICE CREAM

MAKERS,

HOTELS,

CONFECTIONERS.

Five Sizes, from \$5

to \$100.

Send for Circular to

J. S. L. WHARTON

15th & Wood Sts.,

Philadelphia, Pa.

WILMINGTON, DEL., April 17th, 1882.

GENTLEMEN:—In regard to yours of March 17th, would say that in addition to the one bought of you in 1880 to run by hand, we bought one in 1881 to run by steam, and run through it 17 tons in less than two hours (No. A). We are now using both in different places, and like them very much. They are a much better machine for the purpose than any I have yet seen. Yours, truly,

JACOB PUSEY, Prest., Kennebec Ice and Coal Co.

SAVES ICE, TIME, MONEY.



Railroad, Wagon, Box and Other

TRUCKS

Made in all Varieties and Sizes.

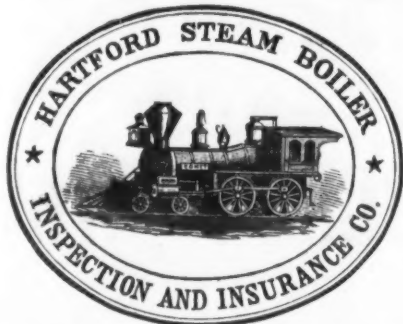
Timber Well Seasoned, Well Ironed and Substantially Framed.

Please send for Prices and Sample Orders. A trial will secure your custom.

Price Lists of Scales and Testing Machines furnished free upon application.

RIEHLÉ BROS. Store, 4th abv. Chestnut, PHILA.
Works, 9th abv. Master,

N. B.—Tests of materials made daily at our works, and certificates furnished. Reports copied and kept confidential.



Issues Policies of Insurance after a careful inspection of the Boilers
COVERING ALL LOSS OR DAMAGE TO
Boilers, Buildings and Machinery,
ARISING FROM
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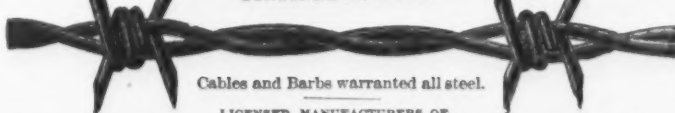
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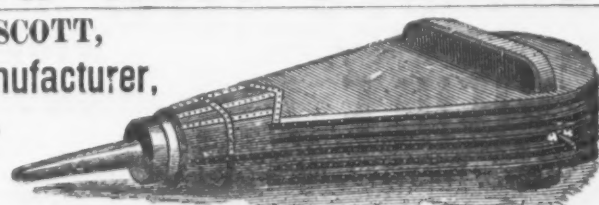
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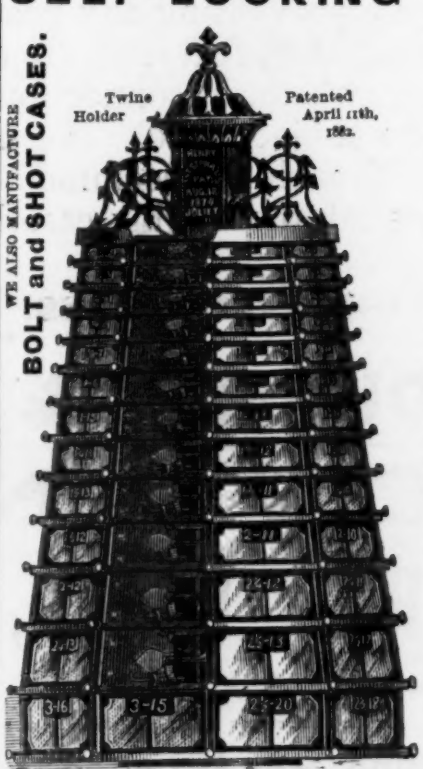
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Made from the Best Gray,
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This is not a Drawer Case. This Structure has been
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and Index to Advertisements.

Agricultural Implements.

Grant Farm Mill and Cradle Co., Melrose, N. Y. 16
Whitman Agricultural Co., St. Louis, Mo. 25

Air Compressors.

Dayton Steam Pump Works, Brooklyn, N. Y. 45
Morris County Machine & Iron Co., Dover, N. J. 31
McLaren John, Hoboken, N. J. 45
The Newark Iron Works Co., Newark, Conn. 44

Aluminum.

Weinhold H., Philadelphia, Pa. 7

Alarm Money Drawers.

Tucker & Dorsey, Indianapolis, Ind. 10

Anti-Friction Metals.

Philadelphia Metal Co., Ltd., Philadelphia, Pa. 46
Stevens Paul S., Philadelphia, Pa. 46
U. S. Smelting Works, Philadelphia, Pa. 16

Arms and Ammunition.

Alford Ward, Davenport & Co., 77 Chambers, N. Y. 35
Conway T. G., 88 Chambers, N. Y. 35
Easton E. L., Chicago, Ill. 11
Hartley & Graham, 17 Malden Lane, N. Y. 11
Jewell John P. & Sons, Boston, Mass. 46
Remington E. & Sons, 25 Broadway, N. Y. 28
Stevens J. & Co., Chicopee Falls, Mass. 28

Asphalt.

Look E. & Sons, Worcester, Mass. 13
Lambertville Iron Works, Lambertville, N. J. 13
Wurster F. W., Brooklyn, N. Y. 46

Barbed Wire.

Cincinnati Barbed Wire Fence Co., Cincinnati, O. 30
Cincinnati Barbed Wire Fence Co., Cincinnati, O. 30
Hawley & Sons, 37 Park Row, N. Y. 13
Iowa Barbed Wire Co., 96 John, N. Y. 7
McLaren John, Hoboken, N. J. 45
Mound City Barbed Wire Fence Co., St. Louis, Mo. 25
Thorn Wire Hedge Co., Chicago, Ill. 30
Washburn & Moen Mfg. Co., Worcester, Mass. 2

Barrel Machinery.

Crosby H. A., Cleveland, O. 33

Belted.

Scott Geo. M., Chicago, Ill. 30

Belted.

Stover Mfg. Co., Freeport, Ill. 16

Belted.

Bertin Bro., N. Y. Co., Easthampton, Conn. 30

Belt Hooks.

Browning, Slum & Co., 84 Chambers, N. Y. 35

Belt Fasteners.

Thatcher & Co., Cleveland, Ohio. 34

Belted.

Alexander Bros., 113 N. 3d, Philadelphia 34

Belted.

Peck & Bemis, Cleveland, O. 35

Belted.

Shultz Belting Co., St. Louis, Mo. 16

Belted.

Whitely B. T., Chicago, Ill. 30

Belted.

Pope Mfg. Co., 527 Washington, Boston. 45

Belted.

The Tricycle Mfg. Co., Springfield, Ohio. 34

Belted.

Jewett John C. & Sons, Buffalo, N. Y. 35

Belted.

Lindeman John, 243 Pearl, N. Y. 3

Belted.

Wiley & Russell, Greenfield, Mass. 35

Belted.

American Belt Co., Lowell, Mass. 43

Belted.

Green & H. L., Murray, N. Y. 26

Belted.

Brass, Manufacturers of.

Ansonia Brass and Copper Co., 10 Cliff, N. Y. 38

Belted.

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Deoxidized Bronze.

Philadelphia Smelting Co., Ltd., Philadelphia, Pa. 46

Differential Pulley Blocks.

Tale Lock Mfg. Co., 45 Chambers, N. Y. 11

Dog Collars.

Modford Fanny Goods Co., 96 Duane, N. Y. 16

Discount Books and Tables.

Leigh E. B. St. Louis, Mo. 28

Dinner Pails and Lanterns.

Haught Joseph, Port Chester, N. Y. 13

Door and Gate Springs.

Keene Bros., Chicago, Ill. 35

Drummers.

Van Wagner & Sons, 15 Liberty St., N. Y. 45

Drummers.

Perkins Machines, Makers of.

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Horse Clippers.

Baker Herman Co., 101 & 103 Duane, N. Y. 3641

Horse Hay Forks.

Waldron John, Muncy, Pa. 39

Horse Nails, Makers of.

Essex Horse Nail Co., Troy, N. Y. 7

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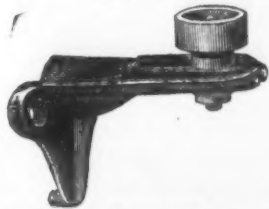
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The cut at the side represents an improvement in Stay Rolls which has long been desired by every one who has ever put on or used the old style of rolls. The great advantages of this roll over the old goods are these:

First, When fastened on the barn, it is impossible for it to turn over and prevent the running of the wheel, as is the case with the old style.

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Third, The wheel has a perfectly true and hard bearing, thus making it run much truer and easier, and will, consequently, last a great deal longer.

Last, but not least, It is recommended by every carpenter, admired by all who see it, is the best selling article ever offered to the trade, and is the only Stay Roll worth putting on a barn.

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STAMPED & JAPANNED TIN WARE

Retinned Ware, Plain Plated Tin Ware, Bathing Apparatus, Toilet Ware, Tea Toys, Spoons, Flesh Forks, Cake Turners, Coal and Fire Shovels, Pickers, Fry Pans, Stove Skillets, Coal Hods, Coal Vases, Water Coolers and Filters, Harness Oil Cans, Soldering Coppers.

Dripping Pans, Elbows, Milk Cans and Fixtures, Roofing Nails, Stove Boilers, Transportation Cans, Buffalo Champion Ice Cream Freezers.

PERFORATED SHEET IRON FOR PAPER MANUFACTURERS AND MALT KILNS.

Grocers', Druggists' and Spice Mills' Tin Ware a Specialty.

Also, A LARGE LINE OF MISCELLANEOUS HOUSE FURNISHING HARDWARE.

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LITTLE GIANT WIRE STRETCHER.

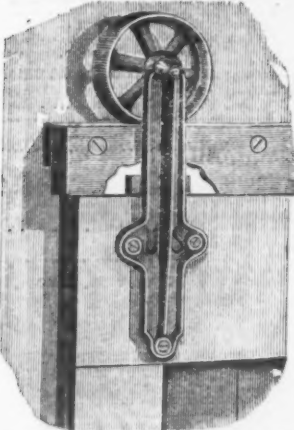
READ.

This is the only Stretcher made with a SELF-ADJUSTING SLOTTED LATCH that will adjust itself to the HATCHET, either side of the post, or at either end of the wire, or either side up, the crank turning at all times in one direction, which is necessary, for reversing the crank would reverse the rope. Stretchers so constructed that the latch will drop down, except when in a certain position, are well nigh, yes, quite worthless.

Hook the eccentric at the end of the rope to the wire, now wind up and a little child can break any wire ever made. For splicing wire, place one end of the wire under the hook on the frame, and the other end to the hook on the side of the post as, when the ground is wet, the strain being on one side, has a tendency to loosen and turn the post. This Stretcher BEING FASTENED TO THE POST, it is not necessary for one man to HOLD IT UP while another operates it, and follows it on route to the post. One man standing at the post operates the LITTLE GIANT alone, and very easily.

Price \$1.50 Each. Discount to the Trade.

ABRAM ELLWOOD, Sole Manufacturer, SYCAMOR, ILL.



THE U. S. WOOD TRACK BARN DOOR HANGINGS.

Patented April 13, 1880; Released Jan. 11, 1881.

This patent covers all rail with a recess in the under side. By using these Hangers you save the cost of iron rail. They cannot be thrown off the track.

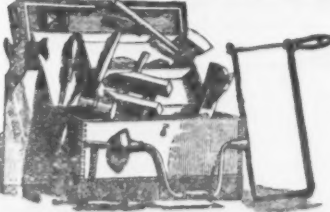
We also manufacture

THE RIDER WOOSTER, and CHAMPION ANTI-FRICTION, and CHECK-BACK HANGINGS, RAIL, STAY ROLLERS, &c.

Send for New Catalogue and Price List.

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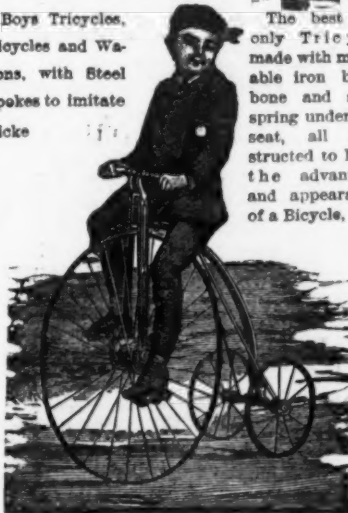
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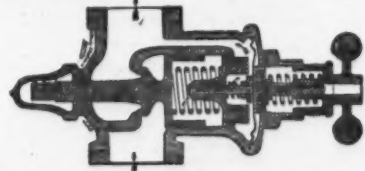
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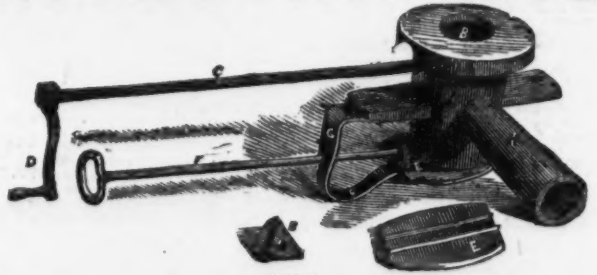
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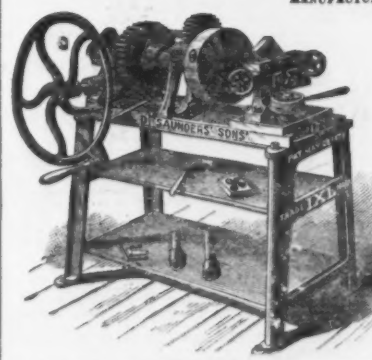
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RAZOR STROP.

THIS RAZOR STROP

is made up throughout of only the very best selected material, such as the practical experience of years has satisfied the inventors alone can be used in its construction with a certainty of standing the test of time.

We confidently recommend it to the trade as

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Self-Measuring Faucet.

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The BEST Hanger and Rail in the market. Will not break; cannot get off the track. As cheap as the best cast iron.

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Snow and Ice cannot lodge on the Rail.

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LOOKEE! WASHEE WASHEE VEELEE QUICKEE!!!

Perfection Window Cleaners can be procured in any quantity from the leading Hardware, Woodenware and Rubber Houses of this country and Europe. Among whom are the following:

IMPROVED AIR COMPRESSOR!

MANUFACTURED BY THE **MORRIS COUNTY MACHINE & IRON CO.**
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Has positive moving Rotary Valves. Will give better results than any compressor built at the present time, which can be authenticated by parties now using them. They are also used to drive pumps in deep mines. With forty pounds of steam will give fifty pounds air pressure. Send for descriptive circular.

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All kinds of Merchant Staples kept in Stock, and Special Staples for any purpose made to order by

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Manufacture and sell the following celebrated brands of sporting Powder known everywhere as

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more popular than any Powder now in use.

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A fibrous material, encasing about 90 per cent. of its volume of air, and therefore a superior

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OVER 600 IN USE.

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THE MORGAN VARIABLE BLAST TUYERE IRON

With the front plate removed, showing the Rotating Air Tubes by which four different sized currents of air may be passed, making any size fire from 3 to 18 inches in diameter. We also furnish an attachment by which we make a narrow fire long or short. This Tuyere Saves Half the Coal, makes a clean fire, gives a center blast, and directs just the amount of heat needed to the point to be heated.

We also furnish a Water Tuyere (see advertisement in this issue of this month) that keeps fire-bed cool, prevents Tuyere from burning, and gives all the hot water needed.

All Tuyeres guaranteed to please or no sale.

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Adjustable Jaw.
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"PEERLESS" SWIVEL PIPE GRIP,
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Wrought Iron Butts, Hinges
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Plain, Japanned, Bronzed and Plated.

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These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, case-hardened throughout, and not only combine all of the superior qualities of our Cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench thus making a combination which has no equal.

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DUNCAN & THOMPSONS, Pittsburgh, Pa.
HAMILTON & MATHEWS, Rochester, N. Y.
McINTOSH, GOOD & HUNTINGTON, Cleveland, O.
PECK & BEMIS, Cleveland, O.
CREIGHTON & SON, Louisville, Ky.
KIPP BROS., Indianapolis, Ind.
FELIX, MARSTON & BLAIR, Chicago, Ill.
GOULD, HALL & CO., Chicago, Ill.
P. N. EARLE & CO., Chicago, Ill.
GOODYEAR RUBBER CO., (and Branches) Chicago, Ill.
SIMMONS HARDWARE CO., St. Louis, Mo.
HALL & WILLIS HDW. CO., Kansas City, Mo.
GORDON HARDWARE CO., San Francisco, Cal.
A. F. CONANT, London, Eng.
FRED'K ORME & CO., London, Eng.
THO. BRYAN, London, Ont.

Dealers will be careful to ask for the Perfection Window Cleaner, and take no other, as all others are infringements which we shall promptly suppress. See that all have two rubbers and bear our name and date of patents.

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Of all description.
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GRINDSTONES

of genuine Nova Scotia and other grits from our own quarries. Mounted stones and fittings, scythes and oil stones, polishing grits, &c.

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Importers and Dealers in all kinds of
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Stones for Machinists, Carpenters, Farmers and Glass Cutters constantly on hand and out to order.

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Sovetsky's Tong	dls 60	dozs 5
Pon and Brass Head, R. & E. list	dls 60	dozs 5
Polished Steel, new list	dls 90	dozs 5
Nails.			
Square heads, by case	.....	dls 70	dozs 5
Less than a case	.....	dls 65	dozs 5
Sledges and Stone Breakers.			
Noise Tool Works	.....	dls 40	dozs 5
Spoke			
Defiance Metallic	.....	dls 20	dozs 5
Iron	.....	dls 45	dozs 5
Bulley's (Stearns' R. & L. Co.), new list	.....	dls 20	dozs 5
Stearns'	.....	dls 20	dozs 5
Spoke Trimmers.			
Bonded	.....	£ dos £100, dls 20	dozs 5
Stearns'	.....	£ dos £100, dls 20	dozs 5
Ives	.....	£ dos £100, dls 20	dozs 5
No. 1, £100; No. 2, £120; £ dos, dls 20	.....	dozs 5	
No. 3, £120; £ dos, dls 20	.....	dozs 5	
Spoons.			
Basting	.....	dls 50	dozs 5
Riveted Table and Tea	.....	dls 55	dozs 5
Britannia	.....	dls 55	dozs 5
Reed & Barton	.....	dls 55	dozs 5
Holmes, Booth & Haydens	.....	dls 55	dozs 5
German Silver	.....	dls 55	dozs 5
Tin (P. S. & W., Teas)	.....	£ dos £ gross, net	dozs 5
Tin (P. S. & W., Tables)	.....	£ dos £ gross, net	dozs 5
Tin (Cowles Edw Co., Case 1018)	.....	dls 20	dozs 5
Tin (Fowles Edw Co.)	.....	dls 20	dozs 5
Stocks and Dies			
"Lightning" Screw Plate	.....	dls 10	dozs 5
Stone.			
Hindston No. 1, 5c; Aze, 6c	.....	dls 40	dozs 5
Gem	.....	£ gross £50, dls 10	dozs 5
Sand Stone	.....	£ B dc, dls 10	dozs 5
Washita Stone	.....	No. 1, £ dos 20, net	dozs 5
Washita Stone	.....	No. 2, £ dos 20, net	dozs 5
Arkansas Stone No. 1, 4 to 6 in.	.....	£ dos 20, net	dozs 5
Arkansas Stone No. 2, 6 to 9 in.	.....	£ dos 20, net	dozs 5
Turkey Slip (Chase)	.....	£ dos 20, net	dozs 5
Lake Superior (Chase)	.....	£ dos 20, net	dozs 5
Grindstones, Family, Loring's	.....	dls 15	dozs 5
Joseph Pollak.			
Genl	.....	£ gross £50, dls 10	dozs 5
Gold Medal	.....	£ gross £50, dls 10	dozs 5
Error	.....	£ gross £50, dls 10	dozs 5
Ruby	.....	£ gross £50, dls 10	dozs 5
Rising Sun	.....	£ gross £50, dls 10	dozs 5
Dixon's Plumbago	.....	£ B dc, net	dozs 5
Squares.			
Steel	.....	dls 50; full cases, dls 50	dozs 5
Iron	.....	dls 50; full cases, dls 50	dozs 5
Nickel Plate	.....	add \$2.50 @ \$5.00 per doz, net	dozs 5
Trident Square and Bevel	.....	dls 20	dozs 5
Diamond's Try Square & T Bevel	.....	dls 20	dozs 5
Winterbottom's Try and Mitre	.....	dls 20	dozs 5
Sticks, Brads, &c.			
List of April 4, 1884	.....	dls 40	dozs 5
Tinned Sweeten Tacks	.....	dls 40	dozs 5
Tinned American Tacks	.....	dls 40	dozs 5
Sweden Tacks, all kinds	.....	dls 40	dozs 5
Sweden Hungarian Nails	.....	dls 40	dozs 5
Gimp and Lace Tacks	.....	dls 40	dozs 5
Finishing Nails	.....	dls 40	dozs 5
Trunk and Clout Nails	.....	dls 40	dozs 5
Basket Nails	.....	dls 40	dozs 5
Brush Tacks	.....	dls 40	dozs 5
American Cut Tacks	.....	dls 40	dozs 5
Cigar Box Nails	.....	dls 40	dozs 5
Double-pointed Tacks	.....	dls 40	dozs 5
Tap Borers.			
Common and King	.....	dls 20	dozs 5
Ives Tap Bore	.....	dls 20	dozs 5
Koberly's	.....	dls 20	dozs 5
Tapes, Measuring.			
American	.....	dls 20	dozs 5
Spring	.....	dls 20	dozs 5
Thermometers.			
Tin Case	.....	dls 20	dozs 5
Tobacco Cutters.			
Wood Bottom (Champion)	.....	dls 20	dozs 5
Wood Bottom	.....	£ dos £200, dls 20	dozs 5
All Iron	.....	£ dos £50, dls 20	dozs 5
Wilson's	.....	£ dos £50, dls 20	dozs 5
Toe Calks.			
Winted	.....	dls 20	dozs 5
Timners' Tools and Machines.			
Machines (P. S. & W.)	.....	dls 20	dozs 5
Machines (P. S. & W.)	.....	dls 20	dozs 5
Transmiffers.			
Violent	.....	dls 20	dozs 5
Reith's Patent, new list, Feb. 1884	.....	dls 20	dozs 5
Kreidler	.....	dls 20	dozs 5
Traps.			
Game, Pewhouse	.....	dls 20	dozs 5
Game, Oneida Pattern	.....	dls 20	dozs 5
Game, Blake's Patent	.....	dls 20	dozs 5
Mouse, Wood Foot	.....	£ dos holes, 15¢	dozs 5
Mouse, Wood Foot	.....	£ dos holes, 15¢	dozs 5
Mouse, Cat Wire	.....	£ dos 25, dls 10	dozs 5
Mouse, Catch-me-alive	.....	£ dos 25, dls 10	dozs 5
Mouse, Cat Wire	.....	£ dos 25, dls 10	dozs 5
Trowels.			
Lotthrop's Brick and Plastering	.....	dls 25	dozs 5
Seed's Brick and Plastering	.....	dls 25	dozs 5
Peacock's Plastering	.....	dls 25	dozs 5
Clement & Maynard's	.....	dls 25	dozs 5
Bradley's Brick	.....	dls 25	dozs 5
Worrall's Brick and Plastering	.....	dls 25	dozs 5
Garden	.....	dls 25	dozs 5
Triers.			
Butter, Cheese	.....	dls 25	dozs 5
Trucks (Warehouse, &c.)			
Pendefield Block Co., Reduced list March 4, 1884	.....	dls 25	dozs 5
Vises.			
Solid Box	.....	List of July 1, 75, dls 100	dozs 5
Solid "Crown" (A. H. Hilditch)	.....	dls 50 to 100, 150 net	dozs 5
Solid, Peter Wright's	.....	1340	dozs 5
Solid, Emery's	.....	1340	dozs 5
Parrel, Parker's	.....	dls 20	dozs 5
Parrel, Wilson's	.....	dls 20	dozs 5
Parrel, Howard's	.....	dls 20	dozs 5
Parrel, Sargent's	.....	dls 20	dozs 5
Parrel, Backus and Union	.....	dls 20	dozs 5
Parrel, Double Screw Leg	.....	dls 20	dozs 5
Parrel, Premiss	.....	dls 25	dozs 5
"Family," List, Chestnut	.....	dls 25	dozs 5
Saw Fliers, Bonney's	.....	£ dos £40, dls 20	dozs 5
Saw Fliers, Bonney's	.....	£ dos £40, dls 20	dozs 5
Saw Fliers, Hopkins	.....	£ dos £75, dls 20	dozs 5
Reading	.....	dls 20	dozs 5
Richardson's Vice and Anvil	.....	dls 20	dozs 5
Washer Cutters.			
Smith's Patent	.....	£ dos £120, dls 20	dozs 5
Johnson's	.....	£ dos £120, dls 20	dozs 5
Appleton's	.....	£ dos £120, dls 20	dozs 5
Washers—See Nuts and Washers.	.....	
Wire Wheels			
Wire	.....	dls 60	dozs 5
Wire and Copper, list of June 10, 1884	.....	dls 20	dozs 5
Bright and Annealed	.....	No. 6 @ 10, dls 20	dozs 5
Bright and Annealed	.....	No. 10 @ 25, dls 20	dozs 5
Bright and Annealed	.....	No. 20 @ 35, dls 20	dozs 5
Bright and Annealed	.....	No. 30 @ 45, dls 20	dozs 5
Bright and Annealed	.....	No. 40 @ 55, dls 20	dozs 5
Bright and Annealed	.....	No. 50 @ 65, dls 20	dozs 5
Bright and Annealed	.....	No. 60 @ 75, dls 20	dozs 5
Bright and Annealed	.....	No. 70 @ 85, dls 20	dozs 5
Bright and Annealed	.....	No. 80 @ 95, dls 20	dozs 5
Bright and Annealed	.....	No. 90 @ 105, dls 20	dozs 5
Bright and Annealed	.....	No. 100 @ 115, dls 20	dozs 5
Bright and Annealed	.....	No. 110 @ 125, dls 20	dozs 5
Bright and Annealed	.....	No. 120 @ 135, dls 20	dozs 5
Bright and Annealed	.....	No. 130 @ 145, dls 20	dozs 5
Bright and Annealed	.....	No. 140 @ 155, dls 20	dozs 5
Bright and Annealed	.....	No. 150 @ 165, dls 20	dozs 5
Bright and Annealed	.....	No. 160 @ 175, dls 20	dozs 5
Bright and Annealed	.....	No. 170 @ 185, dls 20	dozs 5
Bright and Annealed	.....	No. 180 @ 195, dls 20	dozs 5
Bright and Annealed	.....	No. 190 @ 205, dls 20	dozs 5
Bright and Annealed	.....	No. 200 @ 215, dls 20	dozs 5
Bright and Annealed	.....	No. 210 @ 225, dls 20	dozs 5
Bright and Annealed	.....	No. 220 @ 235, dls 20	dozs 5
Bright and Annealed	.....	No. 230 @ 245, dls 20	dozs 5
Bright and Annealed	.....	No. 240 @ 255, dls 20	dozs 5
Bright and Annealed	.....	No. 250 @ 265, dls 20	dozs 5
Bright and Annealed	.....	No. 260 @ 275, dls 20	dozs 5
Bright and Annealed	.....	No. 270 @ 285, dls 20	dozs 5
Bright and Annealed	.....	No. 280 @ 295, dls 20	dozs 5
Bright and Annealed	.....	No. 290 @ 305, dls 20	dozs 5
Bright and Annealed	.....	No. 300 @ 315, dls 20	dozs 5
Bright and Annealed	.....	No. 310 @ 325, dls 20	dozs 5
Bright and Annealed	.....	No. 320 @ 335, dls 20	dozs 5
Bright and Annealed	.....	No. 330 @ 345, dls 20	dozs 5
Bright and Annealed	.....	No. 340 @ 355, dls 20	dozs 5
Bright and Annealed	.....	No. 350 @ 365, dls 20	dozs 5
Bright and Annealed	.....	No. 360 @ 375, dls 20	dozs 5
Bright and Annealed	.....	No. 370 @ 385, dls 20	dozs 5
Bright and Annealed	.....	No. 380 @ 395, dls 20	dozs 5
Bright and Annealed	.....	No. 390 @ 405, dls 20	dozs 5
Bright and Annealed	.....	No. 400 @ 415, dls 20	dozs 5
Bright and Annealed	.....	No. 410 @ 425, dls 20	dozs 5
Bright and Annealed	.....	No. 420 @ 435, dls 20	dozs 5
Bright and Annealed	.....	No. 430 @ 445, dls 20	dozs 5
Bright and Annealed	.....	No. 440 @ 455, dls 20	dozs 5
Bright and Annealed	.....	No. 450 @ 465, dls 20	dozs 5
Bright and Annealed	.....	No. 460 @ 475, dls 20	dozs 5
Bright and Annealed	.....	No. 470 @ 485, dls 20	dozs 5
Bright and Annealed	.....	No. 480 @ 495, dls 20	dozs 5
Bright and Annealed	.....	No. 490 @ 505, dls 20	dozs 5
Bright and Annealed	.....	No. 500 @ 515, dls 20	dozs 5
Bright and Annealed	.....	No. 510 @ 525, dls 20	dozs 5
Bright and Annealed	.....	No. 520 @ 535, dls 20	dozs 5
Bright and Annealed	.....	No. 530 @ 545, dls 20	dozs 5
Bright and Annealed	.....	No. 540 @ 555, dls 20	dozs 5
Bright and Annealed	.....	No. 550 @ 565, dls 20	dozs 5
Bright and Annealed	.....	No. 560 @ 575, dls 20	dozs 5
Bright and Annealed	.....	No. 570 @ 585, dls 20	dozs 5
Bright and Annealed	.....	No. 580 @ 595, dls 20	dozs 5
Bright and Annealed	.....	No. 590 @ 605, dls 20	dozs 5
Bright and Annealed	.....	No. 600 @ 615, dls 20	dozs 5
Bright and Annealed	.....	No. 610 @ 625, dls 20	dozs 5
Bright and Annealed	.....	No. 620 @ 635, dls 20	dozs 5
Bright and Annealed	.....	No. 630 @ 645, dls 20	dozs 5
Bright and Annealed	.....	No. 640 @ 655, dls 20	dozs 5
Bright and Annealed	.....	No. 650 @ 665, dls 20	dozs 5
Bright and Annealed	.....	No. 660 @ 675, dls 20	dozs 5
Bright and Annealed	.....	No. 670 @ 685, dls 20	dozs 5
Bright and Annealed	.....	No. 680 @ 695, dls 20	dozs 5
Bright and Annealed	.....	No. 690 @ 705, dls 20	dozs 5
Bright and Annealed	.....	No. 700 @ 715, dls 20	dozs 5
Bright and Annealed	.....	No. 710 @ 725, dls 20	dozs 5
Bright and Annealed	.....	No. 720 @ 735, dls 20	dozs 5
Bright and Annealed	.....	No. 730 @ 745, dls 20	dozs 5
Bright and Annealed	.....	No. 740 @ 755, dls 20	dozs 5
Bright and Annealed	.....	No. 750 @ 765, dls 20	dozs 5
Bright and Annealed	.....	No. 760 @ 775, dls 20	dozs 5
Bright and Annealed	.....	No. 770 @ 785, dls 20	dozs 5
Bright and Annealed	.....	No. 780 @ 795, dls 20	dozs 5
Bright and Annealed	.....	No. 790 @ 805, dls 20	dozs 5
Bright and Annealed	.....	No. 800 @ 815, dls 20	dozs 5
Bright and Annealed	.....	No. 810 @ 825, dls 20	dozs 5
Bright and Annealed	.....	No. 820 @ 835, dls 20	dozs 5
Bright and Annealed	.....	No. 830 @ 845, dls 20	dozs 5
Bright and Annealed	.....	No. 840 @ 855, dls 20	dozs 5
Bright and Annealed	.....	No. 850 @ 865, dls 20	dozs 5
Bright and Annealed	.....	No. 860 @ 875, dls 20	dozs 5
Bright and Annealed	.....	No. 870 @ 885, dls 20	dozs 5
Bright and Annealed	.....	No. 880 @ 895, dls 20	dozs 5
Bright and Annealed	.....	No. 890 @ 905, dls 20	dozs 5
Bright and Annealed	.....	No. 900 @ 915, dls 20	dozs 5
Bright and Annealed	.....	No. 910 @ 925, dls 20	dozs 5
Bright and Annealed	.....	No. 920 @ 935, dls 20	dozs 5
Bright and Annealed	.....	No. 930 @ 945, dls 20	dozs 5
Bright and Annealed	.....	No. 940 @ 955, dls 20	dozs 5
Bright and Annealed	.....	No. 950 @ 965, dls 20	dozs 5
Bright and Annealed	.....	No. 960 @ 975, dls 20	dozs 5
Bright and Annealed	.....	No. 970 @ 985, dls 20	dozs 5
Bright and Annealed	.....	No. 980 @ 995, dls 20	dozs 5
Bright and Annealed	.....	No. 990 @ 1005, dls 20	dozs 5
Bright and Annealed	.....	No. 1000 @ 1015, dls 20	dozs 5
Bright and Annealed	.....	No. 1010 @ 1025, dls 20	dozs 5
Bright and Annealed	.....	No. 1020 @ 1035, dls 20	dozs 5
Bright and Annealed	.....	No. 1030 @ 1045, dls 20	dozs 5
Bright and Annealed	.....	No. 1040 @ 1055, dls 20	dozs 5
Bright and Annealed	.....	No. 1050 @ 1065, dls 20	dozs 5
Bright and Annealed	.....	No. 1060 @ 1075, dls 20	dozs 5
Bright and Annealed	.....	No. 1070 @ 1085, dls 20	dozs 5
Bright and Annealed	.....	No. 1080 @ 1095, dls 20	dozs 5
Bright and Annealed	.....	No. 1090 @ 1105, dls 20	dozs 5
Bright and Annealed	.....	No. 1100 @ 1115, dls 20	dozs 5
Bright and Annealed	.....	No. 1110 @ 1125, dls 20	dozs 5
Bright and Annealed	.....	No. 1120 @ 1135, dls 20	dozs 5
Bright and Annealed	.....	No. 1130 @ 1145, dls 20	dozs 5
Bright and Annealed	.....	No. 1140 @ 1155, dls 20	dozs 5
Bright and Annealed	.....	No. 1150 @ 1165, dls 20	dozs 5
Bright and Annealed	.....	No. 1160 @ 1175, dls 20	dozs 5
Bright and Annealed	.....	No. 1170 @ 1185, dls 20	dozs 5
Bright and Annealed	.....	No. 1180 @ 1195, dls 20	dozs 5
Bright and Annealed	.....	No. 1190 @ 1205, dls 20	dozs 5
Bright and Annealed	.....	No. 1200 @ 1215, dls 20	dozs 5
Bright and Annealed	.....	No. 1210 @ 1225, dls 20	dozs 5
Bright and Annealed	.....	No. 1220 @ 1235, dls 20	dozs 5
Bright and Annealed	.....	No. 1230 @ 1245, dls 20	dozs 5
Bright and Annealed	.....	No. 1240 @ 1255, dls 20	dozs 5
Bright and Annealed	.....	No. 1250 @ 1265, dls 20	dozs 5
Bright and Annealed	.....	No. 1260 @ 1275, dls 20	dozs 5
Bright and Annealed	.....	No. 1270 @ 1285, dls 20	dozs 5
Bright and Annealed	.....	No. 1280 @ 1295, dls 20	dozs 5
Bright and Annealed	.....	No. 1290 @ 1305, dls 20	dozs 5
Bright and Annealed	.....	No. 1300 @ 1315, dls 20	dozs 5
Bright and Annealed	.....	No. 1310 @ 1325, dls 20	dozs 5
Bright and Annealed	.....	No. 1320 @ 1335, dls 20	dozs 5
Bright and Annealed	.....	No. 1330 @ 1345, dls 20	dozs 5
Bright and Annealed	.....	No. 1340 @ 1355, dls 20	dozs 5
Bright and Annealed	.....	No. 1350 @ 1365, dls 20	dozs 5
Bright and Annealed	.....	No. 1360 @ 1375, dls 20	dozs 5
Bright and Annealed	.....	No. 1370 @ 1385, dls 20	dozs 5
Bright and Annealed	.....	No. 1380 @ 1395, dls 20	dozs 5
Bright and Annealed	.....	No. 1390 @ 1405, dls 20	dozs 5
Bright and Annealed	.....	No. 1400 @ 1415, dls 20	dozs 5
Bright and Annealed	.....	No. 1410 @ 1425, dls 20	dozs 5
Bright and Annealed	.....	No. 1420 @ 1435, dls 20	dozs 5
Bright and Annealed	.....	No. 1430 @ 1445, dls 20	dozs 5
Bright and Annealed	.....	No. 1440 @ 14	

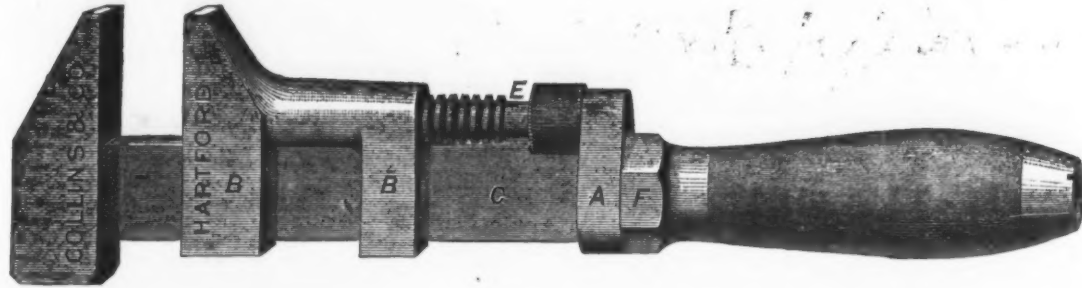
ALEXANDER BROS
BEST OAK BELTING
PHILADELPHIA.

IMPORTANT DECISION

BY JUDGE LOWELL OF THE UNITED STATES CIRCUIT COURT.

THE COLLINS COMPANY VS. L. COES ET AL.

COLLINS & CO.'S WRENCHES, THE JORDAN & SMITH PATENT.



This suit was brought for an infringement of the above patent, which covers the principle of a large nut upon the bar forward of the handle, to relieve it from the back thrust of the movable jaw, which back thrust had prior to this improvement been transmitted through the handle to the small and weak tip or nut at the end of the handle. The infringement was persistently continued for years, until the decision of the Court compelled the infringers to abandon the use of a supporting nut, which is the valuable feature of all Collins Wrenches.

The Collins Wrench (the J. & S. patent), as illustrated above, has a step-plate A, (furnishing a support for the screw E and its jaw B,) so slotted as to permit the Wrench bar to pass through it without reduction in the size of the bar.

The large nut F is threaded on its interior, and engages in a thread on the bar C, and is screwed up firmly against the step A.

The infringement of Coes consisted of also putting a nut upon the bar, which was concealed within a hollow ferrule forward of the handle.

The case was decided in favor of the Collins Co., who hereby warn all persons against making or selling Screw Wrenches embodying the features of their supported Screw Wrench. The Collins Wrenches are made with wide bars of uniform size. They are stronger at the point where all other Wrenches are the weakest, viz., that part of the bar immediately forward of the handle. So-called reinforced bars and ribbed jaws, &c., are devices which add nothing to the real strength of the Wrench.

PRICE LIST OF COLLINS WRENCHES.

	Bright.	Black.		Bright.	Black.
6 inch	\$10.00	\$9.00	15 inch	\$26.00	24.00
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10 inch	14.00	12.00	21 inch	38.00	36.00
12 inch	16.00	14.00			

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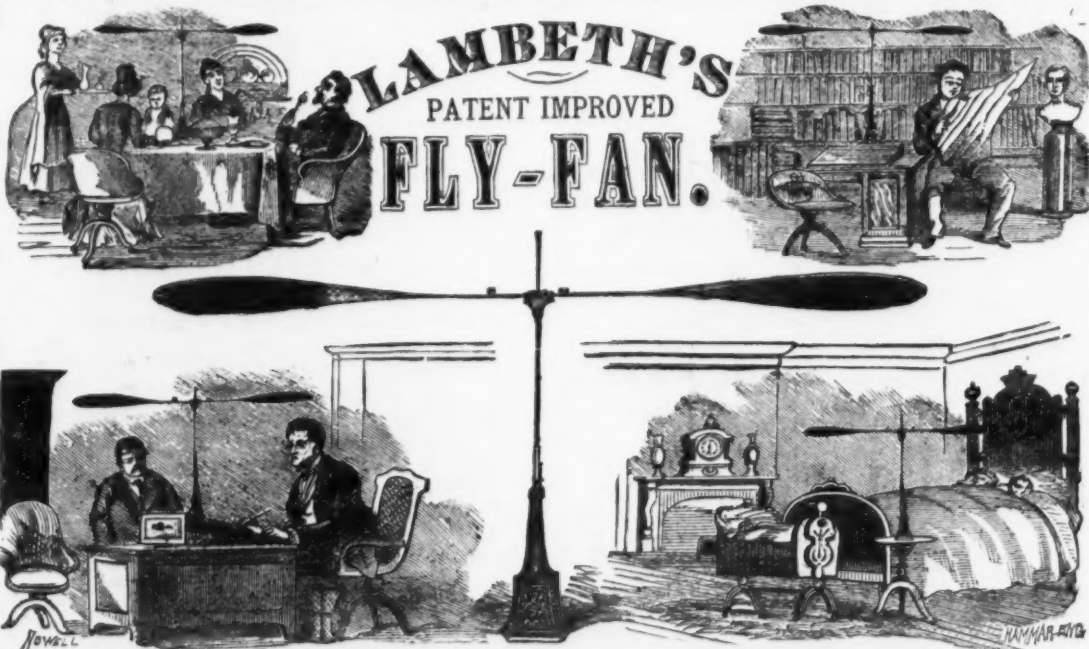
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- It fills a long-endured want in the household, and is so simple that a child can operate it.
- The first cost is a permanent investment, as it will last many years.
- It has been adopted in a large number of the first hotels and private families, and wherever introduced has given entire satisfaction.
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- To the invalid, in summer, it will be a most welcome companion.

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Patented Dec. 1, 1863; May 12, 1864; Jan. 16, 1877; April 17, 1877; March 9, 1880; June 8, 1880; June 25, 1880; Nov. 23, 1880.

TO THE TRADE: PHILADELPHIA, June 8th, 1882.
Dear Sirs.—Having obtained sole control of the Fowler Fly Fan, heretofore manufactured and sold by Mr. W. R. Lafourcade, and recently advertised by him as the "Fowler Fly Fan with all its improvements," I will sell what I have of them in stock to the trade at the prices I have hitherto quoted for the same this season. When this supply is exhausted, however, there will be no more of this style manufactured, as I shall hereafter make only my improved Fans, known as the "Lambeth Patent Improved Fly Fans," which are much superior in durability, efficiency and beauty, as shown by testimonial letters.

As I am now the sole proprietor and manufacturer of the only Fly Fans that are made, uniform prices at the rates established by me this season will be strictly observed, viz.:

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Lambeth's Pat. Imp'd Fly Fan, No. 1, each, \$4.00
Fowler Fly Fan, each, 3.00

TRADE PRICE.
Lambeth's Pat. Imp'd Fly Fan, No. 1, by single doz., \$36.00
Fowler Fly Fan, by single doz., 27.00
Hoping you will favor me with your orders for this indispensable household comfort.

I am very truly yours,
S. W. LAMBETH,

SOLE PROPRIETOR AND MANUFACTURER OF

Lambeth's Pat. Imp'd and Fowler Fly Fans,

No. 42 South 3d St., Philadelphia, Pa.

N. B.—Mr. W. R. Lafourcade has sent the following letter to the parties from whom he has solicited orders for the Fowler Fly Fan:

PHILADELPHIA, June 5th, 1882.
Sir.—Mr. S. W. Lambeth having obtained sole control of the Fowler Fly Fan with all its improvements, I will be unable to fill your orders as I undertook.

Yours truly,
W. R. LAFOURCADE.



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MARTIN'S STOCK PUMPS
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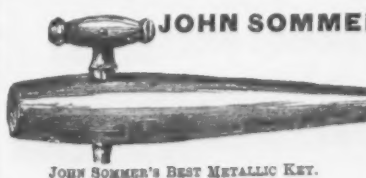
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Of Steel and Iron, up to 30 inches wide, and of any desired thickness and length.

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Manufacturers of
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Warranted equal to any made.
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LOW MOOR IRON COMPANY,
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Best Foundry Iron for Sale in Lots to Suit.

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JARVIS PATENT FURNACE
For Setting Steam Boilers.



Economy of Fuel, with increased capacity of steam power.
The same principle as the SIEMENS PROCESS OF MAKING STEEL; utilizes the waste gases with hot air on top of the fire.
Will burn all kinds of Waste Fuel without a blast, including screenings, wet peat, wet hops, sawdust, logwood chips, slack coal, etc.
Send for circular.

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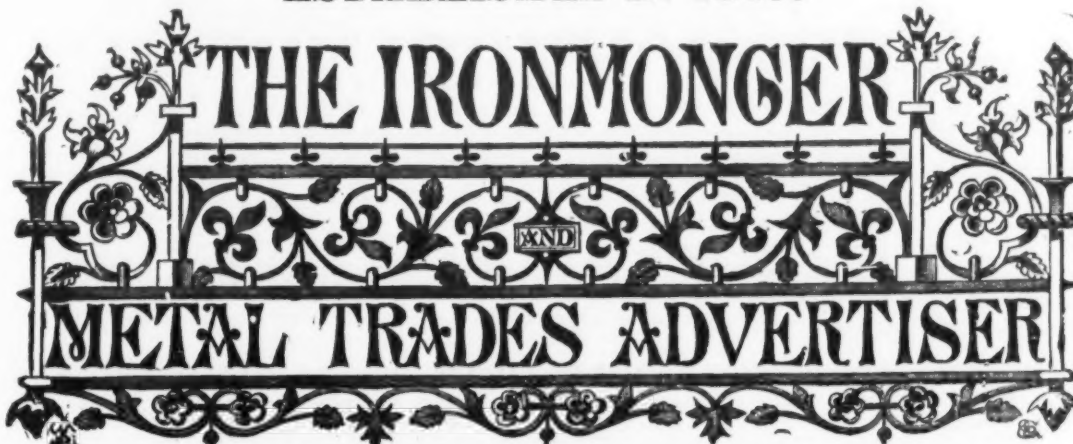
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Notes of Novelties.—This is a department of the journal always watched with interest by the trade, as it contains an account, from week to week, of the novelties which manufacturers and inventors are introducing to the notice of the trade. These articles are freely illustrated.

Special Correspondents.—The *Ironmonger* has a deserved reputation for its special correspondence from all the principal Continental, British and manufacturing centers. The writers are gentlemen holding important positions in the districts with which they are connected, and possess facilities for acquiring information specially suited for the columns of the *Ironmonger*. *The Week, Legal News, Trade Notes, Bankruptcies, Foreign Notes, Colonial Jottings, Merchants' Circulars, &c.*, are each departments of the journal containing a digest of all matters of direct interest to the Iron, Hardware and Metal Trades. In addition to the above, there is a carefully classified list of Patents, together with Editorial Notes French Belgian and other Special Correspondence.

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This is an annual presented free to every subscriber to the *IRONMONGER AND METAL TRADES ADVERTISER*. It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

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With which is incorporated The Universal Engineer.

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JUNE 17, JULY 8, AUGUST 5, SEPTEMBER 2 and 30, OCTOBER 25, NOVEMBER 25, DECEMBER 23, 1882, JANUARY 20, FEBRUARY 17, MARCH 10, APRIL 7, MAY 5, JUNE 2, 1883.

This Supplement is published in

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach but in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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THE WHOLE FOREIGN HARDWARE TRADE

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertiser, sent inserted in the *Ironmonger* and *Foreign Supplement* is a strikingly powerful and most efficient way of publicity not to be compared with any of the other ordinary channels of communication.

HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets,

PHILADELPHIA.

DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.

Fig. 1.



Patented May 29, 1870.

Price, - - - \$37.50 per dozen.

No Farmer, Nurseryman, Railroad
or Telegraph Company
SHOULD BE WITHOUT ONE.

NO BACK-ACHE.

NO KNEE-WORK.

NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the load anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

Fig. 2.



HENRY DISSTON & SONS.

BROWER & LEEDS,

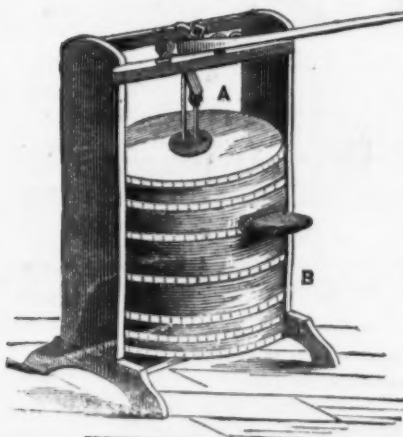
81 Murray Street, NEW YORK,

SOLE AGENTS IN THE UNITED STATES FOR

BAYLISS' HURRICANE BELLOWS,

Portable Forges and Hot Blast
and Water Tuyeres.

SUPERIOR TO ANY. Send for Circulars.



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Tinned
Belt Rivets
AND
Burrs a Specialty.

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MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,
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BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL
PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER
AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS.
DRILL GRINDING MACHINES. TAPER REAMERS, MILLING
CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

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SANDS' TRIPLE MOTION WHITE MOUNTAIN ICE CREAM FREEZERS.

THE WHITE MOUNTAIN FREEZER COMPANY are headquarters for Ice Cream Freezers and Ice
crushers, being the only firm in the United States who manufacture all parts of the raw material. The
Examining Committee, consisting of 30,000
Wisdoms of the United States have recom-



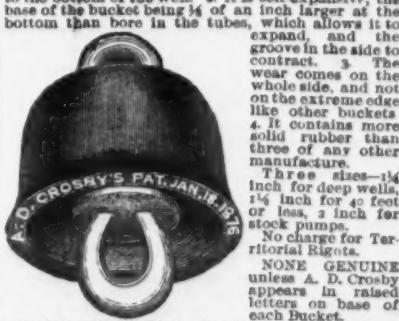
HAND FREEZER. HAND OR POWER. HAND OR POWER.
\$10.00 to \$15.00. \$25.00 and \$30.00. \$75.00 and \$100.00.

White Mountain Freezer Co.,
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SPECIAL ATTENTION GIVEN TO EXPORT ORDERS.

The Most Durable and Best Selling Bucket for Chain Pumps.

It has no valves to become obstructed and no screw
joints to become impossible by rust.



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SEEGER Jack CREWS.

Cast with perfect seamless thread
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Much cheaper than wrought iron
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Liberal discount to the trade.

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And Agent for the
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Maynard's C. S. Planters
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Brake's Crown, Planters and
Hilling; Ewell's Weeding
Planters and Grub, and a
variety of other kinds for
Home and Export Trade.



Prouty's Patent PEERLESS FORCE PUMP.

Has Self-Adjustable Foot Rest.

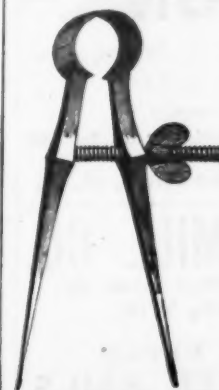
NEW AUTOMATIC COMPENSATING
PACKING.

It will throw a continuous jet FROM
FORTY TO SIXTY FEET. A new pattern
jet and spray nozzle is sent with
each pump.

Especially attention is called to the
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in these pumps.

LIST PRICE, \$8.

THE NEW ENGLAND BUTT CO.
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Also, Surface Gauges and Counter Sinks, Stevens' Patent
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SHOOTING GALLERY RIFLE

Is the favorite everywhere.

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GENUINE BABBITT, Guaranteed at a speed of 20,000 a minute, and at any
pressure for 10 years.

Office JAMES BUTTERWORTH & SON, Manufacturers of Woolen Machinery, 252, 254 and 256 E. Adams St.
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PHILADELPHIA SMELTING COMPANY.—GENTLEMEN: We have been running your "Genuine Babbitt"
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out renewal. We have found it to be the best metal we ever used.
Yours truly, JAMES BUTTERWORTH & SON.

DEOXIDIZED BRONZE,

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.

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PHILADELPHIA SMELTING COMPANY, City.—GENTLEMEN: After a trial of eighteen months of your
"Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we
take pleasure in recommending it as being superior to any we have heretofore used.
Very truly, HENRY DISSTON & SONS.

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MERCHANT BAR IRON,

Skelp Iron, Splice Bars, Railway Track Bolts, Car, Bridge,
and Machinery Bolts, Nuts, &c.

We invite the attention of RAILROAD MEN especially to our make of SPLICE BARS and Track
Bolts. Using the best brands of REFINED IRON, and paying close attention to the finish of our
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Successors to Milo Peck, Manufacturers of



PECK'S DROP LIFTER is the only one which has its parts
cushioned. Being thus cushioned they are the most durable Lifter in
the market.

Can be attached to any drop now in use.

Send for Illustrated Catalogue.

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EXCELSIOR POLISH, METAL QUARTZ, ROTTEN STONE, CROCIUS, ROUGE, GLUE SAND PAPER, EMERY PAPER, AND CLOTH, EMERY WHEELS, &c. &c.
WALPOLE EMERY MILLS,
MILLS, SO. WALPOLE, 114 MILK ST. BOSTON, MASS.

THE "MOUNT CARMEL" OX SHOE.

Steel Toe Calk.

FINISHED READY FOR NAILING ON.

WARRANTED

The Best and Cheapest Shoe Made.

IVES, WOODRUFF & CO.

Manufacturers,

MOUNT CARMEL, CONN.

For sale by dealers in blacksmiths' supplies.

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Manufacturers of

FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.

Rosettes and Pickets for Wire Workers, Castings for Furniture and Piano
Manufacturers. Iron and Metal Patterns of all kinds a specialty.
Correspondence solicited for JAPANNING, COPPERING, BRONZING.

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Corrected Weekly by Lloyd, Sipple & Walton.

Terms, 30 days. For 60 or 90 days, interest added at 10% per cent. per annum.

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Lots of 10 to 25 dozen special price.

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Barber's, 100 lbs. 100.00

Schoff, 100 lbs. 100.00

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American Rail, 100 lbs. 100.00

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Cast Fast Joint, Narrow, 100 lbs. 100.00

Broad, 100 lbs. 100.00

Cast Loose Joint, Narrow, 100 lbs. 100.00

Broad, 100 lbs. 100.00

Acorn, Loose Pin, 100 lbs. 100.00

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Narrow Fast, 100 lbs. 100.00

Loose Joint, 100 lbs. 100.00

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Parker, 100 lbs. 100.00

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Lull & Porter, 100 lbs. 100.00

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German Halter and Coll. list December 31, 100 lbs. 100.00

Galvanized Fitch, 100 lbs. 100.00

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Butcher's, 100 lbs. 100.00

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Bed (new list July 1, 1880), 100 lbs. 100.00

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Box and Side, new list July 1, 1880, 100 lbs. 100.00

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Walton Pocket, 100 lbs. 100.00

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Lauders, Fray & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

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Hart Mfg. Co.'s, 100 lbs. 100.00

Adjustable Handle, 100 lbs. 100.00

Fry Pans.

Tinned, 100 lbs. 100.00

No. 1, 100 lbs. 100.00

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Fry Pans, 100 lbs. 100.00

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Nicholson, 100 lbs. 100.00

Diaton, 100 lbs. 100.00

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1/4 in. roll, 100 lbs. 100.00

1/2 in. roll, 100 lbs. 100.00

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Yerkes & Plumb's, new list, 100 lbs. 100.00

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Howell A. E. Nail Hammers, per doz. net 100.00

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Diaton Loop Handles Crosscut, 100 lbs. 100.00

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Yerkes & Plumb, new list, 100 lbs. 100.00

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Strap and T., 100 lbs. 100.00

Horse Nails.

Ausable, 100 lbs. 100.00

Polished & Ptd and Blued, 100 lbs. 100.00

Globe, 100 lbs. 100.00

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Discount on Ausable, 100 lbs. 100.00

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Lighting, 100 lbs. 100.00

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No. 1, 100 lbs. 100.00

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Screws.		
Flat Head Iron.	100 lbs.	100.00
Round Head Iron.	100 lbs.	100.00
Iron.	100 lbs.	100.00
Plated.		
German Silver.	100 lbs.	100.00
Britannia, Boardman's.	100 lbs.	100.00
Parker's.	100 lbs.	100.00
Tinned.		
Spring-Torrey.	100 lbs.	100.00
German No. 3 small Jap'd.	100 lbs.	100.00
No. 2 medium Jap'd.	100 lbs.	100.00
Coll. No. 10, per gross net.	100 lbs.	100.00
Warner's door springs, per doz. net.	100 lbs.	100.00
Standard Spring Hinges.		
Single No. 6, per doz. net.	100 lbs.	100.00
No. 10.	100 lbs.	100.00
Stove Polish.		
Gem.	100 lbs.	100.00
Dixon.	100 lbs.	100.00
Fire Fly.	100 lbs.	100.00
Tacks.		
Shoe Nails.	100 lbs.	100.00
Double Pointed Tacks.	100 lbs.	100.00
Traps.		
Genuine Onella-Newhouse.	100 lbs.	100.00
Im. Onella-Newhouse list, first qual.	100 lbs.	100.00
Vices.		
Solid Box.	100 lbs.	100.00
Wrenches.		
Agricultural.	100 lbs.	100.00
Cross genuine.	100 lbs.	100.00
Mechanics.	100 lbs.	100.00
Mail Bar.	100 lbs.	100.00
Wire.		
Bright or Ann'd, No. 6 to 10.	100 lbs.	100.00
No. 10 to 12.	100 lbs.	100.00
No. 12 to 14.	100 lbs.	100.00
Coppered, 100 lbs.	100.00	
Tinned Broom Wire.	100 lbs.	100.00
Galvanized Barb Wire.	100 lbs.	100.00
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Galvanized No. 7 to 10.	100 lbs.	100.00
Peelings No. 3/4.	100 lbs.	100.00
Universal No. 2.	100 lbs.	100.00
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PITTSBURGH.

Merchant Iron.

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For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

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1 1/2 to 4 by 1/2 to 1 inch.

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10 to 12 by 1/2 to 1 inch.

12 to 14 by 1/2 to 1 inch.

14 to 16 by 1/2 to 1 inch.

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20 to 22 by 1/2 to 1 inch.

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100 to 102 by 1/2 to 1 inch.

102 to 104 by 1/2 to 1 inch.

104 to 106 by 1/2 to 1 inch.

106 to 108 by 1/2 to 1 inch.

108 to 110 by 1/2 to 1 inch.

110 to 112 by 1/2 to 1 inch.

112 to 114 by 1/2 to 1 inch.

114 to 116 by 1/2 to 1 inch.

116 to 118 by 1/2 to 1 inch.

118 to 120 by 1/2 to 1 inch.

120 to 122 by 1/2 to 1 inch.

122 to 124 by 1/2 to 1 inch.

124 to 126 by 1/2 to 1 inch.

126 to 128 by 1/2 to 1 inch.

128 to 130 by 1/2 to 1 inch.

130 to 132 by 1/2 to 1 inch.

132 to 134 by 1/2 to 1 inch.

134 to 136 by 1/2 to 1 inch.

136 to 138 by 1/2 to 1 inch.

138 to 140 by 1/2 to 1 inch.

140 to 142 by 1/2 to 1 inch.

142 to 144 by 1/2 to 1 inch.

144 to 146 by 1/2 to 1 inch.

146 to 148 by 1/2 to 1 inch.

148 to 150 by 1/2 to 1 inch.

150 to 152 by 1/2 to 1 inch.

152 to 154 by 1/2 to 1 inch.

154 to 156 by 1/2 to 1 inch.

156 to 158 by 1/2 to 1 inch.

158 to 160 by 1/2 to 1 inch.

160 to 162 by 1/2 to 1 inch.

162 to 164 by 1/2 to 1 inch.

164 to 166 by 1/2 to 1 inch.

166 to 168 by 1/2 to 1 inch.

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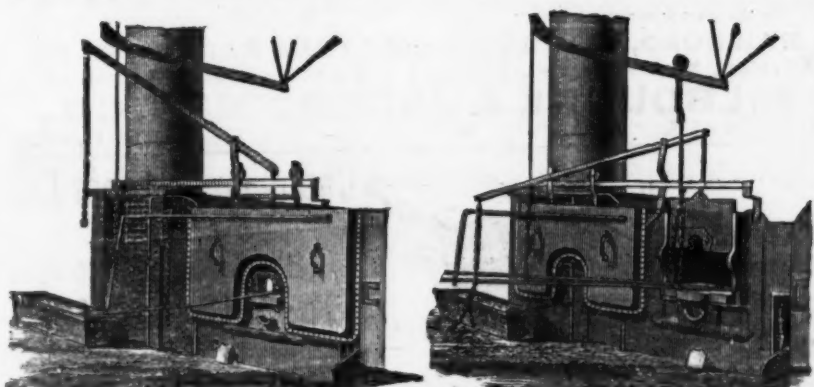
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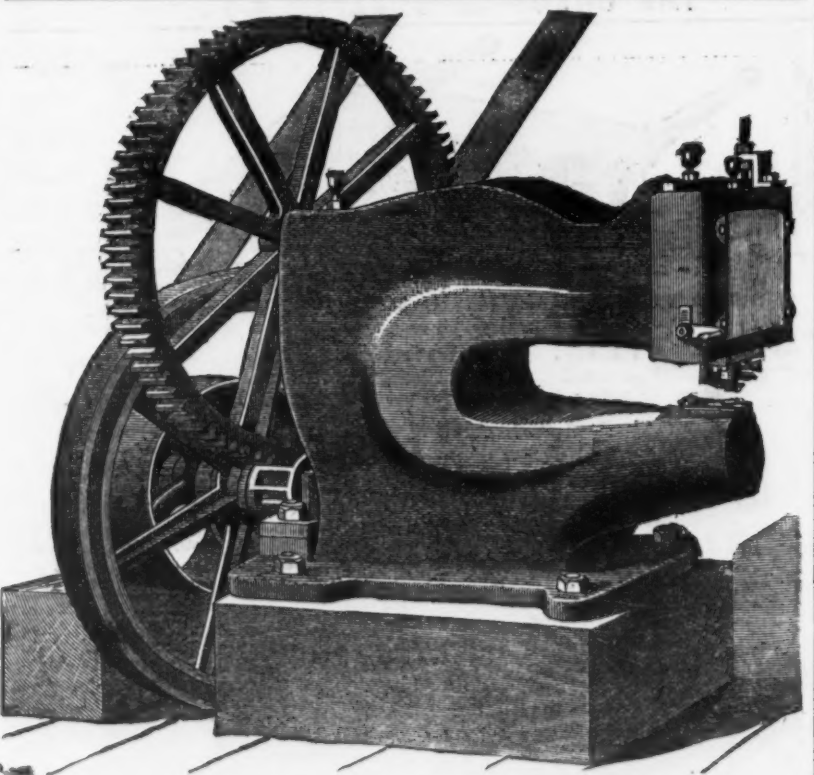
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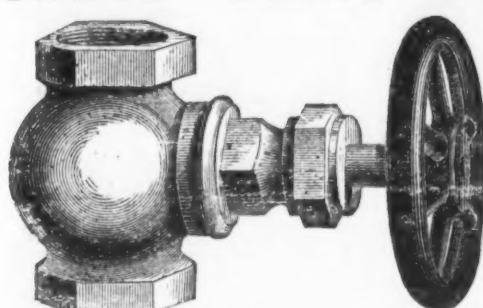
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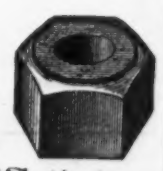


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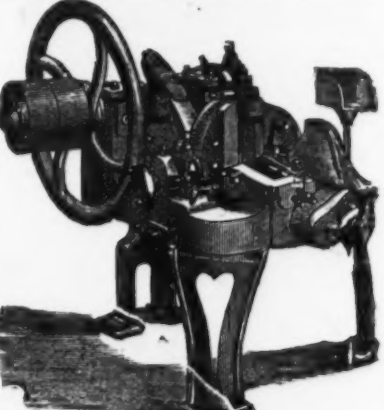
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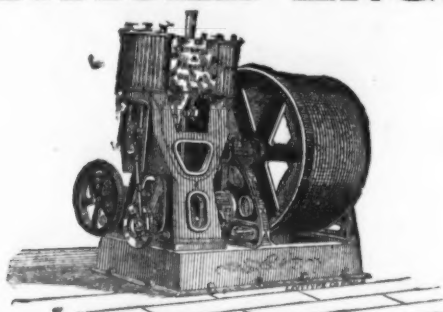
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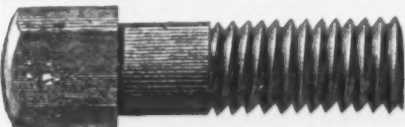
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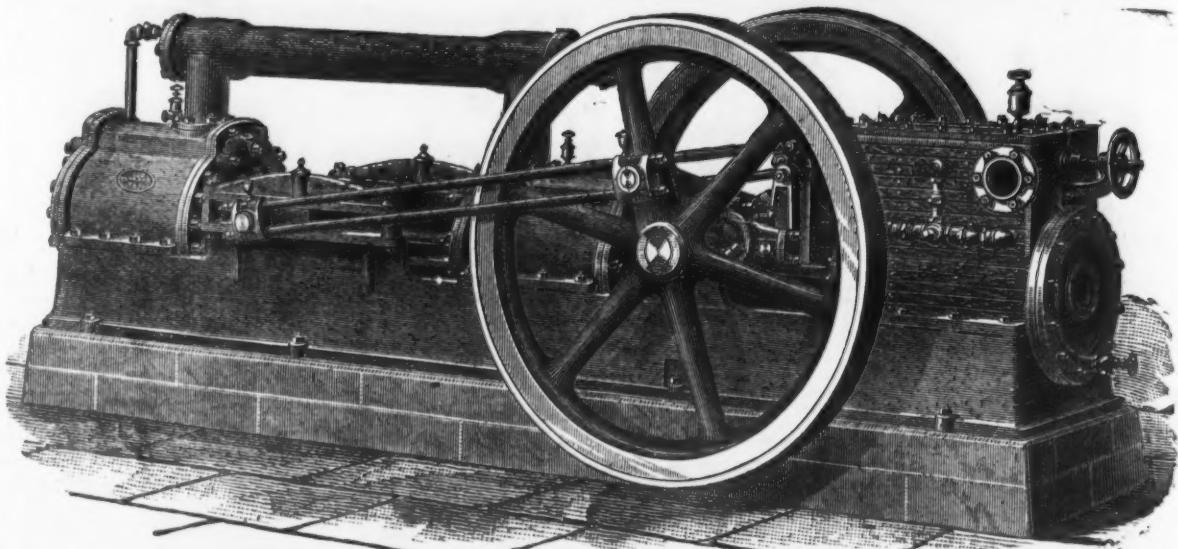
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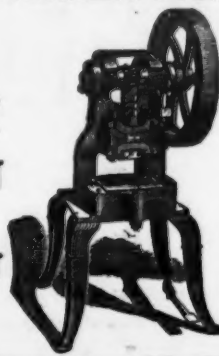
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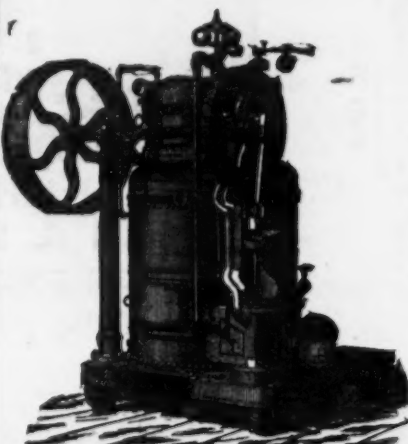
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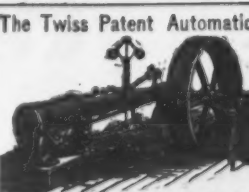
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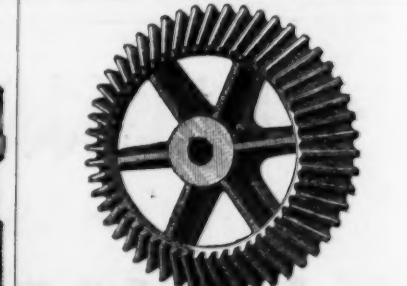


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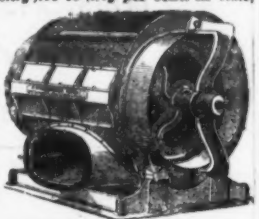


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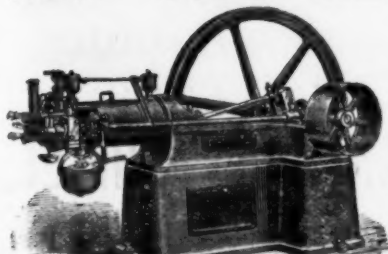
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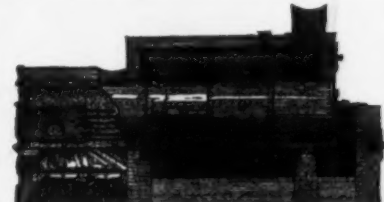
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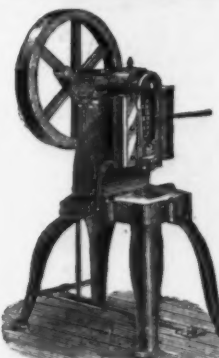
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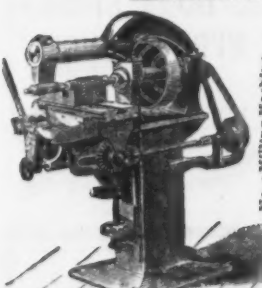
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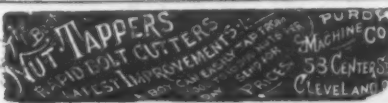
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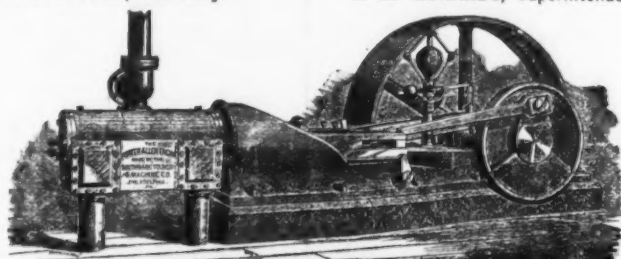
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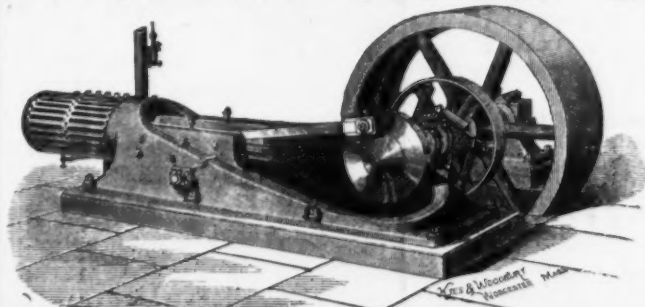
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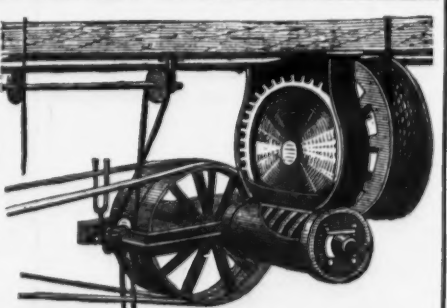
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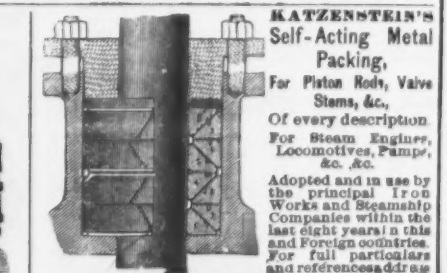
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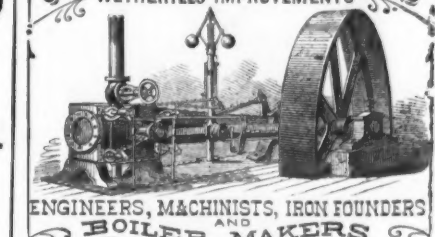


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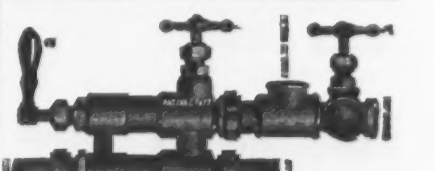
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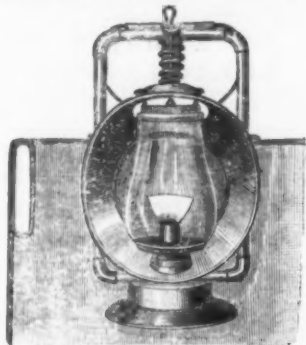
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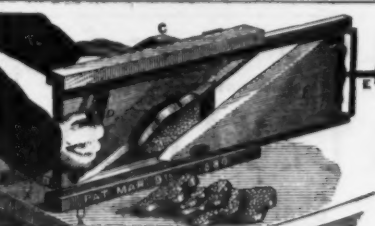
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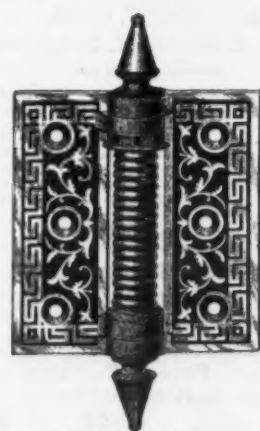
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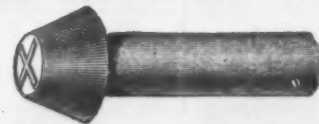
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